No. 512.—VOL. XIX.] SATURDAY, AUGUST 23, 1851. { TWO NUMBERS, 1s. WITH LARGE SHEET, GRATIS.

THE GREAT EXHIBITION.

SCULPTURE.

UPON making a general survey of the works of Sculpture of all Nations in the Great Exhibition, and revising the memoranda we have jotted down from time to time in regard to them, we find that we have yet much to notice in this interesting department, which we shall endeavour to do justice to without further delay, lest, as the season is drawing to a close, we should not have another opportunity.

We shall begin with Power's Greek Slave, which has been thrust forward in such a prominent position, and upon which king mob has lavished so much wild and unmeaning encoimum. We took leave to aver, in a few lines published on the 9th inst., that we did not join in the admiration bestowed upon this work, briefly suggesting the grounds of our disapproval. As we are aware that in so doing we run counter to the opinions of the majority of the critics of the day, we may be permitted to add a few more observations, to explain, perhaps to justify, our position. First, the figure is ill studied: of course, the proportions of beauty are, to a great extent, matter of taste or opinion; but, without laying claim to infallibility in these matters, we aver that the figure of the Greek Slave, as it is wide from the ideal beauty of the antique, would, upon an average of suffrages, fail to establish its claims with the present generation of beholders. It is a lengthy, leggy figure below; square and high-shouldered in the upper part: the flesh has none of the plumpness and softness, the attainment of which is the triumph of the sculptor's art; the arms, particularly the left one, unduly spare. Secondly, the attitude is constrained and inelegant. The figure is made to lean with the right hand against a post, just a very little too low to allow her to remain in an upright position: the consequence is, that there is a departure from the ordinary repose of nature, without a sufficient object, and an awkward outline on both sides of the figure, but particularly on the left. It must not escape remark, neither, that, in carrying out this ill-judged conceit of attitudinizing, the artist, whilst he has shown its effects very prominently in the lower parts of the back, has overlooked it entirely in the right arm and shoulder. The attitude is constrained and inelegant, because it wants naturalness—because it wants unity of purpose: the arms drawn one way, the head turned abruptly to the other; so that there is no seeing the full face but with a side view of the figure, and that side, as a point of view, subject to many objections, and *vice versâ*. For the head itself, we cannot consider it by any means beautiful; to us it is certainly not pleasing: it is too square; the forehead too prominent for female beauty; the eyes too much sunk for any expression—and, of all shades of expression that of softness, which is the attribute of womankind (in marble); and the profile, as it is the first view generally taken of this head, is unfortunately its least agreeable aspect: the nose sharply pointing outwards and upwards, instead of pursuing the direct line from the forehead, so as to preserve the oval form; the chin prominent and lengthy from the starting-point at the neck; and, to make the matter worse, and to complete the extravagance of the outline, the hair drawn up in a stiff hard knot, when a few loose loops falling half way down the neck would have done much to relieve the harshness of the general expression. The artist has bestowed much pains upon the little Greek cap, which with her other raiment, the unhappy slave has very neatly displayed upon the post against which she leans; but we think she would be puzzled to wear such a head-gear with her present mode of *coiffure*.

GROUP OF SILVER FROM RUSSIA.—(SEE PAGE 252.)

And now a few words about the incident supposed to be characterised in this production. Not to run the risk of doing injustice, we will copy the official description affixed to the statue:—"The figure is that of a young and beautiful Greek girl, deprived of her clothes, and exposed for sale to some wealthy Eastern barbarian, before whom she is supposed to stand with an expression of scornful dejection, mingled with shame and disgust." A very interesting case, truly, but one the knowledge of which deprives the work of that legitimate charm "which attaches to the nude figures of ancient art, wherein an obvious innocent unconsciousness of *dishabille* prevents all compunction on the score of propriety." The official account is particular to inform us of the accurate identity of the Greek costume, and the little cross; but adds, "the chains on the wrists are not historical, but have been added as necessary accessories." Necessary to go beyond the truth to realise the whole of a very painful conception, which, we submit, in its most offensive incident—that of the denudation itself—is "not historical!"

To conclude, the Greek Slave is a poor *refacciamento*, with alteration, but without improvement, of the "Venus di Medicis," with a story attached to give it a relish. It is a bad beginning for American art, on all accounts; which must produce something more *genuine*, if it intends to take rank with the schools, bygone and to come, of Europe.

Proceeding now to the British Sculpture Room, we find a "Nymph Startled," in marble, by Behnes, which exhibits none of the meretricious coyness and other objectionable characteristics of the work we have just noticed at such length. The figure is cast in a good wholesome mould; the attitude graceful and animated, without affectation; the flesh soft and smooth; and the general finish of the work in every respect satisfactory. We must also admire, for the purity of its treatment, a whole-length marble figure, lightly draped, after the antique fashion, by T. Campbell, entitled "Portrait of a Lady as a Muse." These two are by far the best things of the kind in

the room. Sharp's "Boy and Lizard" is a pretty conceit prettily carried out. The sitting statue of Flaxman, by the late M. L. Marshall, is a fine specimen of portrait sculpture, replete with dignified ease and high intelligence.

And while upon the productions of British art, there are several, which, though located in the Italian department, we may properly claim, being the work of English hands. Of these, the two Nymphs, by the late lamented Richard Wyatt, justly claim pre-eminence, not only here, but perhaps above all other works of the same class in the Exhibition. It may be proper to observe, that these works have been added since our first notice on British sculpture, on the opening of the Exhibition, was written, or we should then have claimed them with avidity for the honour of our country. There is a bench convenient to the spots, so that we may sit down and contemplate these graceful studies at leisure. Remark in both the symmetrical proportions, the exquisite softness of the flesh surfaces, the winning simplicity of the attitudes, the smiling beauty of the faces, more particularly as regards the full round speaking eye of the smaller one; the classic proportions of the heads, set off and adorned with tresses light, wavy, and picturesque in form and disposition;—examine the careful finish of the whole, and you cannot hesitate to set these down as works evidencing the highest genius, and the nearest approach to artistic perfection. Close beside these has lately been introduced a figure entitled "Highland Mary" (see Burns), by B. E. Spence, a work not without merit, but tame and without speech, as compared with her two lovely neighbours. This figure is fully, indeed, somewhat heavily, draped, a great plaid shawl hanging down her back, and nearly touching the ground.

Pursuing our way into the Roman department, we find many efforts, in various styles and of various degrees of merit. An "Iconic Statue," by M. Lawrence Macdonald, is a heavy, cold, unintellectual study, upon which more labour has been bestowed than the subject was worth. A "Ceres," by John Gott, is of the commonplace order of prettiness. "Love Triumphant," by Angelo Bienaimé, is a foolish conceit, consisting of a Cupid on a lion's back. Benzoni's group of "Pysche trying to keep Cupid from carrying the gift of beauty to Venus," is a cold and artificial affair, considerable pains having been bestowed on the heads. Rinaldi has a large theatrical-looking group of "Rinaldo and Armida," in which the female figure, arrayed in Turkish costume, is finished with considerable roundness and softness, whilst the knight is stiff as buckram, in coat of mail; the buckler, leggings, and helmet being brought to a degree of polish which speaks highly of labour misapplied. Cardwell's group of two little boys with a bird's-nest, busy feeding their feathered captives, is one of many puerile productions, both in the Roman and Tuscan departments, which are attributable, perhaps, more justly to a low standard on the part of the patrons of art than of art itself. In the front of the Tuscan chamber has recently been added a very vigorous and characteristic bust of "Lorenzo the Magnificent," by Costole, of Florence. Sad falling off in matters of art since his day!

Of the art of many-climed Austria we have spoken at some length in a former Number; the bold and startling productions from the Zollverein (Kiss's "Amazon," the "Bavarian Lion," &c., to wit) we have also sufficiently illustrated from time to time. We may remark generally of the Zollverein states, with Prussia at their head, that in art they exhibit the crudeness almost inseparable from new efforts, when there are no old examples, no traditional principles to guide the hand. The subjects chosen are too often of a base order, unworthy of high art, and are sometimes treated with an extravagance intolerable to an educated taste. It may be sufficient to point to one very glaring example of both these errors. Fortunately, it is not a very prominent one in the present Exhibition; though, in Berlin, where the original of the work exists in marble, it is vastly popular—indeed, has received the highest honours. In an obscure passage in the rear of the Zollverein department, will be found by those who are curious to search for it, a cast of a Bacchante on a Panther, after the original in marble, by T. Kalide, "sculptor and professor of arts." Nothing can be conceived in worse taste, or executed in more bold defiance of the proprieties. The Bacchante, a coarse, heavy figure, is dead——that is, is intoxicated, and lies sprawling on her back on the top of the panther, who licks up the dregs of liquor she has left in her cup. The artist seems to have taxed his ingenuity to make the most of the most offensive features of such a subject, and we think he has succeeded.

Moving into the French department, we find, at the entrance of the Gobelins Room, a somewhat similar subject, though certainly not so flagrantly carried out, by Gleisinger. Here the Bacchante, having evidently indulged too freely in her favourite juice, is lying asleep in an attitude of wild *insouciance*, not upon the back of a panther, but upon a bed of vine leaves and grapes. The treatment is less indelicate than that of M. Kalide's figure, and the execution masterly in many respects; but still it is of a sensuous character, which neither derives interest from the medium through which it is presented, nor adds dignity to the art employed upon it.

Still in France, we are struck with some very wonderful melo-dramatic scenes in plaster, by Lechesne, which attract a crowd of gazers in the middle of the Nave. In the centre we have a woman fast asleep under some straggling branches of trees, whilst an eagle, with tremendous breadth of wing, is pouncing upon her naked infant, who blubbers piteously, but hopelessly. On either side are two exemplifications of canine fidelity and sagacity. In the one we see a tremendous snake about to dart upon a little urchin, who, terrified, crouches behind a large dog of doubtful breed; in the other group we see that the young gentleman's confidence has not been misplaced, for there lies the venomous reptile, with his head bitten clean off, whilst the little boy overwhelms his deliverer with his caresses.

M. Etex has several works which exhibit talent and originality of conception in various lines: his two large plaster groups in the Nave—the one representing a family bereaved by the cholera, the other the family of Cain after the murder of Abel—are certainly vigorous efforts, albeit somewhat chargeable with extravagance. His "Hero and Leander" is good in execution, though his figures, particularly the female, are of a heavy mould. Several minor works by the same hand, including some bas-reliefs, have considerable merit.

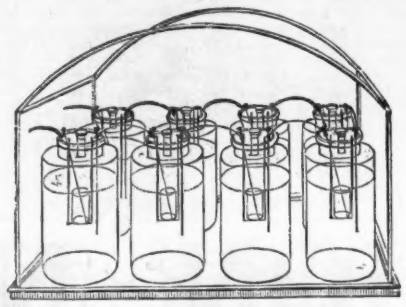
On the left hand, on entering the Gobelins Room, is a group, by A. de Bay, of Eve with her two children, Cain and Abel, in her lap, whom she hugs to her bosom, clasping her hands round her knee, whilst she seems to indulge in a reverie as to their future fate. There is something very picturesque and striking in the conception, which is ably carried out. At the base are slightly sketched bas-reliefs of the temptation by the serpent, the sacrifices of Cain and Abel, and the first murder, which explain and give character to the work.

The "Cephalus and Procris" of M. Ramus is a group of some merit, and with considerable expressiveness.

In general, the works of the French school, unequal in individual merit, are interesting, and mark the existence of an educated school, though one in which the classic rules have frequently been forgotten. Amongst the few works in which classic treatment has been aimed at, we must mention with commendation Lemaire's Psyche, with the butterfly, in marble, extremely graceful; and Pradier's bronze group of Venus, half kneeling, and whispering Cupid, and the same artist's Phryne, which stands in front of the entrance of the Gobelins Room.

THE EXHIBITION VOLTAIC BATTERY.

In former Numbers we have described and figured Shepherd's clock; but on the present occasion we must give a short notice of the novel form of voltaic battery which is employed as a source of power, and which our readers may observe in the gallery of the South Transept. This form was devised by Mr. Alfred Smee for this clock, and contains numerous adaptations of scientific principles. The negative plate consists of a strip of platinised silver, the platinum being used in the finely divided state, in which Mr. Smee first discovered that most metals had the singular power of facilitating the evolution of the hydrogen; and the visitor may observe a constant stream of infinitely fine bubbles of gas continually rising to the surface of the fluid. The positive pole consists of pieces of the thinnest rolled zinc immersed in mercury. The reason for using this zinc is, that, in the process of manufacture the purest zinc is used for that purpose, whilst the baser portion is used for the thicker plates. The use of the mercury is to prevent local action by the adhesion of the hydrogen to its smooth surface. It is of very great consequence to place the porous pot in the right place. If it were placed at the bottom of the solution, during the action of the battery it would become incrusted with crystals of sulphate of zinc, which would effectually prevent any further action. By suspending it, however, at the upper part of the solution, the salt falls eventually to the lower part of the solution, and becomes uniformly diffused through the whole fluid. A platinum wire, coated with gutta percha except at its end, passes into the mercury, and is connected to a binding screw to form connexion. The battery is charged with dilute sulphuric acid, in the proportion of one to eight, and the size of the outer vessel must depend upon the time which the battery is required to keep in action, and the amount of the work which it is called upon to perform. In obtaining force for an arrangement of this character, nothing can exceed the economy of material, for almost every particle of zinc dissolved contributes its effective power, and thus the cost solely depends upon the value of the zinc. There can be no question that there is nothing to be compared to this form of battery for clock purposes, and probably it will be found the best battery for telegraphic communications. Whether it can be as successfully employed for electro-metallurgic operations and other cases of heavy work as the ordinary form of Smee's battery, we are unable to

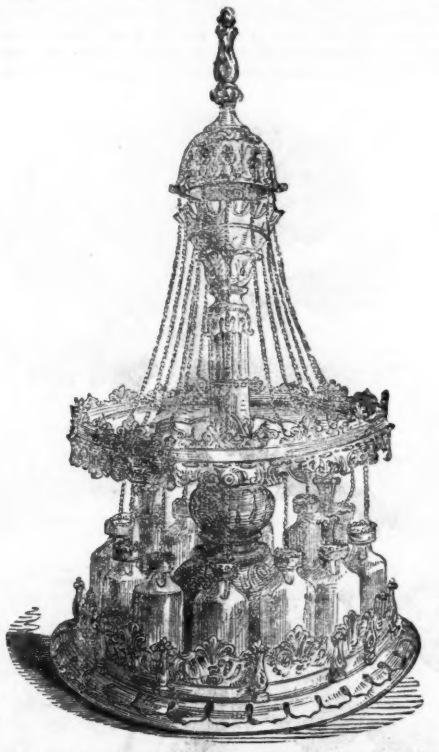


THE EXHIBITION VOLTAIC BATTERY.

tell, but recommend its trial to those who are interested in this matter. The great clock, notwithstanding the large surface exposed to the wind, and the recent high gales, has continued to mark the time in a satisfactory manner. We regret, however, to record that some mischievous or malicious person has cut the wires, on one or two occasions, which communicated the power to the dial in the Western Nave, and the same clock, having received some injury, has not performed as well as its more noble companion.

THE TEMPEST PROGNOSTICATOR. BY DR. MERRYWEATHER.

This is an ingenious contrivance for the protection of life and property, by giving warning of approaching tempests. It is described by



THE TEMPEST PROGNOSTICATOR. BY DR. MERRYWEATHER.

the inventor as "an atmospheric electro-magnetic telegraph, conducted by animal instinct." It will repay inspection by those interested in scientific researches.

A LADY'S GLANCE AT THE GREAT EXHIBITION.

NO. III.

WHILST each of the many examples of the works of nature, of science, and of art comprised in the various classes into which the Exhibition of the Industry of all Nations is divided, attracts its own peculiar circle of votaries, there is one which is found to claim successfully the admiration of every description of visitor, although addressed for the most part to the tastes and predilections of the female sex. I allude to the magnificent specimens of jewellery and precious stones with which the Crystal Palace abounds; to an extent, indeed, that half enables us to realise in our minds the wildest wonders of an Arabian tale; to believe that the hall of Vathek might not have been wholly imaginary; and that Sinbad's diamonds may find a local habitation after all. Whatever grave objects may attract grave people to this temple of concord, there are few even of the gravest who will depart from it altogether without paying a prolonged visit to the departments of Class 23. The most learned of *savans*, the coldest of utilitarians, the political economist, the bishop and the Quaker, may there be found side by side patiently awaiting their turn for a passing glimpse at its marvels; half ashamed of an admiration they are unable to conceal or to disguise. There doth the philosopher arrest his steps to analyse the component parts of those wonderful substances, and endeavour to calculate the succession of ages that must have been demanded for their development. There, too, stands the sturdy labourer, with his wondering wife by his side, gazing at them with looks of undisguised astonishment, and anticipating in imagination the advantages which even a passing acquaintance with such marvels will give him over the less fortunate companions of his toil at home; whilst the *millionaire* on his left is vainly endeavouring to compute the money value of the objects before him, and lamenting that so vast an amount of capital should be so unproductively employed.

Leaving them to their several reflections, let me see if I cannot improve so fruitful an opportunity, and jot down a few memoranda which may assist in recalling to the mind this fairy fabric and the most interesting portion of contents when they shall have passed away and be no more seen. Towards the accomplishment of this object, a few anecdotes illustrative of the history of the gems and precious stones of the Great Exhibition may not prove unacceptable.

There are few things in the history of commerce more remarkable than the enormous mercantile value which has attached, by common consent, in all ages, and in all civilised countries, to the diamond, if at all remarkable for its size and brilliancy. The measure by which the price of the diamond is usually regulated is called a carat, of which 150 are required to make the ounce. The carat is divided and subdivided into half-carats, quarters, or grains; eighths, sixteenths, and thirty-seconds. So soon as the diamonds are manufactured, or, to employ a technical term, *made*, they are handed over from the lapidary to the jeweller to arrange, display, and set, so as to produce the best possible effect, whether destined to form a necklace, ear-drop, ring, brooch, or pin. The setting should be obtruded as little as possible on the eye; for it is by concealing everything but the *effect* of his labour, that the jeweller displays the gem on which his taste and ingenuity have been expended to the best advantange. It often happens that so much pains are bestowed upon the setting of a gem, that a diamond a carat in weight may be made to appear as large as a well-proportioned stone of six grains. A diamond, properly set, therefore, is equal in value to one unset of the same quality of twice its weight. As the technical terms employed in the description of the brilliants which are exhibited in the Crystal Palace are not generally understood, a few preliminary words by way of explanation may not be considered out of place. The bezels are the upper sides and corners of the brilliant, lying between the edge of the table and the girdle. The collet is the small horizontal plane or face at the bottom of the brilliant. The crown is the upper-work of the rose, which all centres in the point at the top, and is bounded by the horizontal ribs. The facets are small triangular faces or planes, both in brilliants and rose diamonds. The girdle is the line which encompasses the stones parallel to the horizon. Lozenges are alike common to brilliants and roses. In brilliants, they are formed by the meeting of the facets on the bezil; in rose diamonds, by the meeting of the facets on the horizontal ribs of the crown. Pavillions are the under sides and corners of the brilliants, and lie between the girdle and the collet. The ribs are the lines or ridges which distinguish the several parts of the work, both of brilliants and rose diamonds. The table is the large horizontal plane or face at the top of the brilliant. Diamonds are brilliant cut, rose cut, table cut, and *lasques*. The brilliant is, of course, the form that is most highly esteemed, because it exhibits to the best advantage the peculiar lustre of the gem; but if it ensures the best possible effect, it also entails a much larger waste of the stone. The brilliant is formed of two truncated pyramids united by a common base, the upper pyramid being much more deeply truncated than the lower. The rose diamond is the shape given to those stones, the spread of which is too great, in proportion to their depth, to admit of their being brilliant cut. It is formed by covering the rounded surface of the stone with equilateral triangles, placed base to base, making the figure of a rhomb. The table diamond, inferior still to the rose, is made of those stones, which, with a considerable breadth, are of very trifling depth. It is produced by a series of diminishing four-sided planes below the girdle; and the bezil is formed by one, two, or three of these planes. Lasques are formed from flat or veiny diamonds, and are only manufactured in India. Diamonds from one to four carats, lose little less than half their weight in the process of cutting; so that the value of a manufactured stone is twice that of a rough diamond. If the manufactured diamond is found to contain a flaw, or is what is technically called "off colour," its value is proportionately diminished, sometimes one-third, or even one-half. If it be breathed upon until its lustre is temporarily destroyed, its imperfections may be easily discovered. On referring to a series of tables for estimating the value of the diamond, which have been framed by Mr. David Jeffrey, long a recognised authority on such questions, I find that the brilliant is valued according to its weight, in the following ratio: a brilliant of the weight of one carat, £80; of ten, £800; of twenty, £3240 2s. 6d.; of forty, £12,800; of fifty, £20,000; and of one hundred, £80,000. If the shape be irregular, or the diamond be deformed by the slightest speck or variation of colour, there must be, of course, a corresponding diminution of its value. With this deduction, the principle or rule is, that the proportional increase in the value of diamonds is as the square of their weight. Having indulged in these preliminary explanations, I propose to enumerate those magnificent jewels of which either the originals or the models are at present on view in the Great Exhibition in Hyde Park, seasoning my account as I proceed with such facts and anecdotes as I have been enabled to collect respecting them.

The Koh-i-Noor, or Mountain of Light, has been repeatedly dwelt upon in these columns and in contemporary journals; but, notwithstanding the enormous value at which it has been estimated (from £1,500,000 to £3,000,000), has disappointed public expectation in no ordinary degree the ungraceful peculiarity of its shape, and the ineffective manner in which it has been cut, although more than half its weight has been wasted in the operation, having deprived it of much of the brilliancy and beauty of which no doubt the original stone would, in skilful hands, have proved susceptible; and, in spite of the various costly expedients which have been resorted to for the purpose of exhibiting it to the best advantage, it is still very far from realising the anticipations which had been formed of its attractions. Its value has been hardly less absurdly exaggerated. Tested by Mr. Jeffrey's elaborate tables, it is worth £260,000; but the awkwardness of its shape and the injury it has sustained in the cutting, will, if duly taken into account, reduce the amount to less than half that sum. This diamond is said to have formed one of the eyes of the jewelled peacock of the famous musnud or throne of Aurungzebe: the twin eye is among the crown jewels of Russia, and weighs only 139 carats; so that the optics of this gorgeously apparelled bird must have been far from pairs. The Koh-i-Noor, however, with every other known diamond, is wholly eclipsed by one of the crown jewels of the Queen of Portugal, which has been estimated at the ridiculous price of £5,644,000, weighs 1680 carats, and is almost as large as a turkey's egg. It has never been entrusted to a lapidary to cut and polish; its possessors considering it most prudent that its character should rest upon its traditional reputation. If a thing be, as Butler assures us, worth only as much as it will bring, where is a customer to be found for such a treasure? The exact weight and dimensions of the Durra-i-Noor, or Sea of Light, exhibited by the East India Company, has not, so far as I am aware, been ascertained. It is set as an armlet, is surrounded by ten smaller brilliants, and is evidently a gem of prodigious beauty; but, obscured by the tastelessness of its setting, demands the eye of a professed lapidary to discover the whole of its attractions. The celebrated Russian sceptre diamond, which is said to weigh 779 carats, and which has been valued at £4,854,000, is believed to be unrivalled for its extraordinary brilliancy and freedom from imperfection. The Mogul diamond—of which we have only a traditional knowledge, derived from the pages of Tavernier—weighs 296 carats, and is of an oval shape, about half the size of a hen's egg. It has been valued at £632,000; but of its present "whereabouts" I am entirely ignorant. It was discovered on the coast of Golconda, a country identified with the history of diamonds for centuries. The large diamond that formed the eye of an Indian idol, was stolen by a French soldier, and was, after many vicissitudes, purchased by Catherine of Russ a for £90,000, and an annuity of £4000 in addition, is now among the crown jewels of Russia. The Pitt diamond, found on the Malacca coast, and purchased by the Governor of Bencoulen for £20,000, weighed 410 carats, and was sold to the Duke of Orleans for £135,000. The expense of cutting it amounted to £3000, and although this process reduced its weight to 136½ carats, it is considered, so far as quality is concerned, the finest brilliant in Europe. In 1791 a committee of jewellers fixed its value at £400,000. The Persian diamond, the Mountain of Splendour, valued at £145,000, and the great German diamond, valued at £155,000, are well known by the respective models. The largest known yellow diamond in Europe, weighing 139½ carats, belongs to the Emperor of Austria. It was originally the property of the Grand Duke of Tuscany. The Pigott diamond, of only 49 carats, formed the grand prize of an English lottery upwards of forty years ago, and was gained by a young man, who sold it for a trifle. It afterwards became the property of Mehemet Ali, the late Pacha of Egypt, who purchased it of Messrs. Rundell and Bridges, for £30,000; a price which, considering its remarkable beauty, must have been very much below its value. The largest blue diamond ever known is in the collection of Mr. A. J. Hope, and weighs 177 carats. It has a delicate blue tinge, like that of a light-coloured sapphire. It is cut in small facets, in the shape of a medallion; and is surrounded by twenty large brilliants, of the purest water. There is a blue diamond in the collection of her Majesty, formerly the property of George IV., which weighs 44 carats. It approaches nearer to the sapphire than to the brilliant. The King of Saxony possesses a green diamond, which forms the button to the plume of his state hat; and there are several large brilliants, some parti-coloured and of green apricot and pink, among the jewels of the late Mr. H. P. Hope, exhibited by Messrs. Hunt and Roskell. The Nassuc diamond, taken in the Mahratta

THIS SHEET WAS PRINTED IN THE GREAT EXHIBITION.

war, weighs 79 carats; but is of triangular form; and, having been polished with a view to retain as much of its original weight as possible, is far less valuable than its size would seem to indicate. The Nizam diamond, brought to this country by Warren Hastings, and presented by him to Queen Charlotte, weighs 101 carats; and is still, we may presume, among the Crown jewels of England.

Having already referred to the existence of diamonds of almost every form and colour, we must not omit to draw attention to the black diamond (not a coal, though a carbon), exhibited by Mr. Joseph Mayer, which may be regarded as a very great curiosity. It weighs 350 carats, and is so extremely hard that it has resisted every attempt that has been made to polish it. Last, but not the least useful object in the Exhibition, is the boart, a species of inferior diamond, used to cut and polish stones of this description, and exhibited by Messrs. Hunt and Roskell. *Apropos* of these gentlemen, one of the most interesting departments of the Exhibition is that in which they exhibit specimens of all the various known precious stones in their unmanufactured state, including numerous objects illustrative of the best modes in use of grinding, polishing, and preparing them for their final destination. The models of the various celebrated diamonds, exhibited by Mr. Tennent, the mineralogist, Messrs. Thomason, Mr. Aspley Pellat, and others, are also objects of great attraction, and will reward the trouble of a careful inspection.

Although pearls are considered by the lapidary to stand next in commercial importance to diamonds, their relative value as ornaments for the person is regarded by many as far inferior to that of the ruby, the emerald, or the sapphire. However this may be, I propose to accord to them the preference that is claimed for them. One thing at least is in their favour—they are unsusceptible of any improvement by art; we are constrained to leave them as we find them, with all their defects upon their heads. Pearls of the finest quality are those which are perfectly round, and which are thus fitted for necklaces, bracelets, jewels for the hair, and rings. The pear shape is, however, not regarded as an imperfection, because of its susceptibility of being converted into pendants for the ear, solitaires, Sevignés, and ferronnières. Their colour should be milk white, and not of a dull lifeless hue. They should be free from stains, specks, or roughness. If dark and misshapen, they become wholly unsuited for ornaments for the person; and if the holes drilled through them, for the purpose of stringing them together, be too wide, their mercantile value is materially impaired. The largest known pearl in the world will be found among the jewels exhibited by Mr. A. J. Hope in the Exhibition of the Industry of all Nations; and, but for the eccentricity of its shape—that of a human hand—and the irregularity of its colour, would be of almost priceless value. It is of a size altogether unique, being two inches in length, and four inches and a half in circumference. It weighs 3 ounces, or 118 grains, and wants but colour and symmetry of form to be worthy of a King's ransom. In the absence of these indispensable qualifications, it is merely a *lusus naturæ*, better fitted for the museum than the casket. There are several other pearls, of a very remarkable character as natural productions, in the same collection, as well as in that exhibited by Messrs. Hunt and Roskell—some black, some in the forms of a fish, and one of a pink colour.

The East India Company include among their jewels two necklaces of extraordinary beauty—one comprising 224 and the other 101 large pearls, of perfect form and colour. Those, however, who would satisfy themselves to how much greater advantage pearls appear when tastefully associated with diamonds, rubies, or emeralds, will do well to examine in detail the exquisite *parures* of this description which are among the jewels of the Queen of Spain (the crown and tiara more especially), Messrs. Hunt and Roskell, Messrs. Garrard, M. Bolin (jeweller to the Emperor of Russia), and Messrs. Froment Meurice. Pearls are valued on the same principle as diamonds, viz. by the square of their weight. Two tables have accordingly been adopted of the prices of pearls, one for small pearls, and the other for large ones. The wholesale value of a carat of pearls, 150 to the ounce, is only 2s.; and of an ounce, £15. The value of a carat weight of larger pearls is 8s.; of 10 carats, £40; of 20 carats, £160; of 50 carats, £1000; of 100 carats, £4000; and so on. Their value, compared with that of diamonds, is as 8s. to £8. The highest price given in the trade for any pearl is from 16s. to 20s. per carat, and this only on rare occasions. Pearls are liable to damage from water, or from atmospheric influences. If a lady washes her hands without removing her pearls from her fingers, they will sometimes turn either yellow or black. They demand more care at the hands of their owners than any other description of jewels.

Of Oriental stones, the sapphire first claims attention. In its purest state, its colour is a clear bright indigo blue (the deeper the better) and is united with a high degree of translucency. It is, however, more commonly of a lighter blue, and cloudy; not unfrequently transparent in one part, and spotted and streaked with a deeper colour in another. It is found in various parts of India, but oftener in the streams and rivers of Ceylon, and oftenest of all in Pegu, where it occurs in rounded and crystallised fragments, seldom exceeding in size a hazel nut, although occasionally considerably larger. One of the finest, if not the very finest, sapphire in the world is in the collection of Mr. A. J. Hope. It weighs 133 carats, is extremely rich in colour, and without a flaw. Messrs. Hunt and Roskell exhibit, from the collection of the late Mr. H. P. Hope, several magnificent sapphires; among others, a splendid stone of octagonal shape, of 118 grains; another, of the same shape, of 180 grains; a third, of 65½ grains, and an opalescent sapphire, of 70¾ grains, curious but defective. Some seven or eight more, in the same case, of smaller weight, but of first-rate quality, will enable the amateur of this exquisite gem to make himself perfectly acquainted with its character in all its varieties. Sapphires, of from 20 carats downwards, are often in the market, and may be purchased unset at from £30 to £35 The value of the sapphire depends more upon its brilliancy and colour than on its size. Mr. A. J. Hope exhibits his well-known "sapphir merveilleux," which is blue by day and amethystine by night.* The asteria, or star stone, is another variety of the sapphire, which exhibits the form of a star with six radii, all of which sparkle with great vividness, as its position is varied in the sun. It is semi-transparent. The finest specimen I have ever seen of this gem is in the Garde Meuble, in Paris. Among the jewels belonging to Mr. H. P. Hope, which are exhibited by Messrs. Hunt and Roskell, are no fewer than six sapphire asterias, of first-rate quality: one of them has an iris, displaying all the colours of the rainbow.

The Oriental ruby, one of the rarest and most esteemed of precious stones, is believed to differ from the sapphire in colour alone, its hardness, form of crystalisation, and specific gravity being the same. Its colour, when perfect, is a cochineal red. It is, however, oftener pale, and sometimes shaded with blue. Hence it occurs rose-red, blossom-red, and lilac-coloured, when it degenerates into the amethyst. "More precious than rubies," is a Scriptural expression, which goes far to establish the fact of its extreme rarity in former days. One of the finest known rubies is exhibited by Mr. A. J. Hope, who has had it re-cut with advantage to its beauty; there is also in his collection a carved Oriental ruby, of *cinque cento* date, of the head of Jupiter. Rubies of ten carats each are extremely rare and valuable. One of four carats has often been sold for upwards of £60. Rubies, Indian cut, may be purchased at a comparatively cheap rate; but all precious stones wrought by Indian artificers are always more or less deteriorated. A perfect ruby of six carats weight is equal in value to a diamond of the same size. These stones are, however, seldom met with of a fine quality of a greater weight than a carat and a half. There is a fine intaglio of Minerva in Mr. A. J. Hope's collection, engraved on an Oriental ruby of 53 grains. The spinelle ruby, when perfect, which is rarely the case, is of great value. Its colour is carmine, or rose-red. It is said to take that tint from the oxide of chrome, and the Oriental ruby its deeper hue from the oxide of iron. There are no fewer than eleven spinelle rubies, all more or less fine, in the collection exhibited by Messrs. Hunt and Roskell. One of them is of 23½ grains weight. The Balais ruby is a stone of inferior quality of the same family. Most of the portraits of Henry VIII. represent him with a magnificent collar of rubies; but they no longer form part of the Crown jewels.

The emerald is next in rarity and value to the ruby. It is of a pure unmixed green, and recalls to the mind the refreshing verdure of spring. It is usually seen to the best advantage when surrounded by brilliants. It varies in colour from the palest to the deepest green, and is so rarely seen perfect that it has given rise to the proverbial comparison, "like an emerald without a flaw." There are several emeralds of extraordinary size and beauty in the Indian department of the Great Exhibition; but they are, for the most part, much obscured and deteriorated by the coarseness and clumsiness of their settings. They form the girdle of a Sikh chief. The emerald belonging to the Duke of Devonshire, exhibited in the case of Mr. Tennent, of the Strand, is one of the finest in the country. Mr. A. J. Hope exhibits an emerald in its stone matrix—a very great curiosity. The exquisite beauty of the emerald, when associated with diamonds and other precious stones, may be seen in the tiara with its green foliage of the Queen of Spain, and, if I remember aright, in a similar ornament in the compartment of M. Bolin, in the Russian Court. The value of a fine emerald of 4 carats is about £50. This stone requires to be differently set from other gems, in order to display it to the best advantage. It should be cut in steps, larger or smaller, according to the intensity of its colour. One of the largest emeralds ever seen in England was that which decorated on state occasions the turban of the Nepaulese ambassador. In Mr. Hope's collection, so frequently referred to, there are three large emeralds of remarkable size, one of which has been sacrilegiously converted into a vinaigrette.

The precious opal, in its most striking form, is far from common; but there are no tables to enable us to estimate its value. Its colour is white or pearl grey, and when interposed between the eye and the light, is pale red, or yellow, with a milky translucency. By reflected light it is rendered iridescent with emerald green, golden yellow, flame-red, violet, purple, and blue; so blended that it is difficult to fix with the eye the exact locality of any one of the colours. When these varieties of hue present themselves in small spangles, it is entitled the harlequin opal. It sometimes displays only one colour; at others the emerald green, and orange yellow: when it assumes the latter it is distinguished as the golden opal. It is often full of flaws, which, strange to say, increase rather than detract from its beauty. In the collection of Mr. H. P. Hope's jewels, displayed by Messrs. Hunt and Roskell, there are several fine opals from Hungary upwards of an inch long, and nearly an inch wide. Some of them display a profusion of prismatic colours. There are eight from Mexico, several of them of magical beauty. The opal ought never to be otherwise cut than hemispherically. This stone was held in superstitious reverence by the ancients; we read of a Roman senator who preferred death to resigning his opal into the hands of the Emperor Nero. It is no part of my present province to notice in this place the interfusion of opals with rubies and brilliants; but the opal pendent and drop set with rubies and brilliants, exhibited by Messrs. Garrard, must not be overlooked.

The family of the topazes is a large one: first, there is the Oriental topaz, then the yellow, red, blue, and white. The deeper its colour, the more valuable the stone. The topaz is not held in very great esteem. One of upwards of eighty carats weight has been sold for £100. The pink is made from the yellow topaz by artificial means. The red topaz fetches the highest price, because the most uncommon. There are upwards of a dozen Brazilian and Saxon topazes in Mr. H. P. Hope's collection exhibited by Messrs. Hunt and Roskell, more than one of which are parti-coloured. It contains also some white topazes, familiarly known as the mina nova.

The aqua marine is, as its name implies, of a sea-green colour, and is oftenest found in Ceylon and the Brazils; sometimes it is of a greenish yellow, a bluish green, and greenish blue. It was formerly a stone of considerable value, but has been discovered of late in such quantities as to have occasioned a complete glut of it in the market; some of those exhibited by Messrs. Hunt and Roskell, are of remarkable size and beauty of colour. One is almost as blue as a sapphire, another is yellow, and others parti-coloured. One of the finest specimens that is known forms the handle of Murat's sword, and is in the possession of Mr. A. J. Hope. The largest aqua-marine in the world is in the collection of her Majesty. It was presented to George IV. by Lord Strangford.

The garnet has been confounded, improperly, I think, with the carbuncle, by the old writers on precious stones. It comes not only from India, but from Greenland, Bohemia, and Syria. A century ago it was in great request. It is now chiefly used for gentlemen's shirt pins. Garnets may be worn with mourning. There are several large and fine garnets in the Hope collection, some of which are violet-coloured, others ruby red, and others parti-coloured.

The Oriental amethyst unites in colour the blue of the sapphire with the red of the ruby. It is, in fact, the colour of the purple grape. The best stones are found in Siberia, although the greatest number are imported from the Brazils. They have long been out of fashion, and are now chiefly used in seals and brooches. Mr. H. P. Hope's collection, exhibited by Hunt and Roskell, is exceedingly rich in this beautiful but neglected gem. The amethyst loses much of its brilliancy by candlelight.

The peridot, or common crysolite, is of a rich olive green colour, of more or less intensity, and is only found in the Levant. It is neither very hard nor very brilliant, unless by candlelight, when it is always seen to the best advantage. It requires to be cut in steps to set it off properly. It is chiefly employed in bracelets and Sevignés. There is a fine engraved peridot in Mr. Hope's collection, representing Apollo and the lizard in intaglio: it is engraved by Calendrilli. This stone was exceedingly scarce a few years ago, but, although specimens of a very light hue are plentiful enough now, we have rarely met with one of the proper intensity of colour. These stones are affected by the atmosphere, and are sometimes rendered dull and almost opaque by the cold and damp.

The chrysoberyl, or Oriental chrysolite, was in great odour a century ago. Shakspeare, intending, of course, to select the most precious gem he could think of, makes Othello declare, that, had Desdemona not have deceived him, and the world had been one "perfect chrysolite," he would not have sold her for it. The chrysolite is the only coloured stone that shews to the greatest advantage cut brilliant-wise. The cymophane emits a luminous white ray, which seems to change its position as it receives the light. I do not remember to have met with a single specimen of it in the Crystal Palace.

The yellow crystal, rock crystal, sardonyx, and chrysophrase, belong to the same class, both in order and translucency. The cat's eye is considered as a sort of crystal enveloping amaranthus. Fine specimens of this stone are regarded with superstitions veneration by the Cingalese.

The sard was always selected by the ancients for the purpose of engraving upon them. They may sometimes be obtained very large. The chrysophras, which is of a cloudy green colour, is a poor stone, of comparatively little value. It is affected both by cold and damp, and is chiefly employed for seals and ladies' brooches. It does not admit of being cut in the ordinary way.

The opaque stones, with a single exception, hardly fall within our province. The turquoise is, however, so exquisite a gem, when set with diamonds, rubies, emeralds, or pearls, that we cannot afford to overlook it. The finest variety, called *turquoise Vieille Roche*, is uniform and compact. The turquoise is much in request among jewellers. Those who would see it in perfection must refer to some of the jewels of M. Bolin, the jeweller to the Emperor of Russia; and especially to the exquisite bracelet recently purchased of that gentleman by Mr. A. J. Hope. The turquoise harmonises best with brilliants and pearls. It is easily and effectively imitated.

The jargoon used to be considered a species of diamond, but has of late years gone wholly out of fashion. In the Hope collection there are some very fine specimens. The tourmaline is chiefly remarkable for its electrical properties. It usually occurs in black and opaque crystals; its colours are green, blue, or pink. By heat or friction it becomes electric, and retains the property for many hours. The moonstone is a translucent gem of a bluish white colour. Spheroidically cut, it reflects a strong light. It is principally used for ring stones and ear-rings. The sun-stone is a rich variety of aventurine, which reflects a bright flame colour. It is of a silicious character, and owes its peculiar beauty to the arrangement of its particles or scattered specks of mica in ferruginous quartz. Messrs. Hunt and Roskell exhibit a sun-stone cameo of a monkey's head, which affords a just notion of the singular character of the stone. They have also supplied a fine specimen of the sun-stone. But I have far exceeded the space I had prescribed for myself on this occasion, and must reserve for a future opportunity my notices on the *parure* jewellery adapted for ladies, which forms so very striking a feature of the Great Exhibition: meanwhile I may venture to remark, that, whatever ascetics may say to the contrary, no philosopher will deny that objects which form so large a portion of the wealth of the civilised nations of the earth are well calculated to excite that rational curiosity which it cannot be unbecoming to gratify.

* This identical gem afforded foundation for a story from the pen of Madame de Genlis.

MUSICAL INSTRUMENTS.

(THIRD NOTICE.)

Among the numerous and almost infinitely varied kinds of musical instruments in the Great Exhibition, there are none of modern introduction after the pianoforte, that have become so quickly popular, or are so generally adapted for the amateur as well as professional artist, as the musical instruments the tones of which are produced by vibrating plates of metal, in contradistinction to strings as in the pianoforte, harp, violin; or tubes, as in the organ, flute, horn, &c. The concertina, harmonium, seraphine, accordion, musical boxes, &c., are included in this class: the common Jew's harp is also of the same kind; and though most simple and primitive in form and sound, we possess in it the principle on which the construction of these instruments is founded; and no doubt this mere school-boy's plaything gave the first idea, which, with the aid of science and observation, combined with mechanical ability, has led to the production of this distinct and agreeable class of modern instruments. A vibrating plate (called also a reed or tongue) is a thin narrow strip of metal fastened at one end, while the other is left free, and placed over an aperture (also cut in metal) which is nearly its counterpart, and in which it is so fitted, that, while it touches nowhere, it only allows a certain quantity of air to pass through: the current or column of air forces the plate from its position, to which it again returns by its own elasticity, and the temporary diminution of the pressure consequent on the escape of the air; and thus a constant series of vibrations, causing continuous tone, is excited. We have given this brief explanation of the mode of producing the sounds in this class of instruments, because, in point of construction, they are characterised by some superior qualities, which must have considerable influence on their general appreciation, such as the length of time they keep in tune, their durability, the sweet and melodious quality of the tones, with the power of sustaining or prolonging them at pleasure, and their capability of being put into very compact forms, as in the concertina, &c. The demand for musical instruments of this kind has very much increased within the last few years, and the manufacture of them forms no inconsiderable part of the industry of many towns and cities on the Continent, as well as in London. Thus, an immense number of harmoniums, organs, and concertinas are made in Paris, and imported into this country; thousands of accordions are manufactured in Germany, and exported to England and all parts of the world; and the fabrication of musical boxes of all kinds is a source of employment to a large number of persons in Switzerland.

The concertina, the most elegant and perfect instrument of its kind, was patented about twenty years ago by Messrs. Wheatstone. The invention is due to Professor Wheatstone, by whose scientific labours many valuable and important improvements in the construction of instruments with vibrating plates have been effected. Since its first introduction the concertina has steadily progressed in public favour; and, perhaps, the best proof of the sterling merits of the instrument is the readiness with which it has been taken up by professors of ability; and whoever has heard such artists as Regondi, Case, Blagrove, &c., perform on it, must agree that its invention has been a valuable addition to those musical instruments that are more especially adapted for the drawingroom; its lightness and portability are also greatly in its favour.

Messrs. Wheatstone (Class 10, No. 526) exhibit a number of concertinas of every description—treble, baritone, tenor, bass, and double; and one also dissected, to show the construction of the interior, which fully displays the care and finish for which their instruments are well known: and it may be as well to explain, that it is owing to the superior workmanship in the making and fitting the tongues, and the construction of the bellows, that the English concertinas surpass, in beauty of tone and durability, those made on the Continent. The folding harmonium, also by Messrs. Wheatstone, is exceedingly ingenious, and will be highly appreciated by travellers. It has five octaves, and is excellent in tone and quality; and, though standing sufficiently high for a person to sit to, can, by a well arranged division of the keys, and some very cleverly contrived machinery, be made to close up, and occupy a space not much larger than a good-sized tea-caddy.

Mr. Chidley (No 544) exhibits some concertinas in highly ornamented cases, and Mr. Case (No. 545) some excellent instruments.

The display of harmoniums is more limited than we should have anticipated, considering the increasing popularity of these instruments. M. Alexandre and Son, of Paris, exhibits, in the French department, a very fine one, made for Thalberg, with their patent percussion mechanism, considered to be a great improvement, as it affords superior facilities for execution by the promptness with which the tone is produced. We have, also, an *orgue de voyage*, by M. Müller (No. 1365). Though a portable instrument, it does not approach, in completeness of mechanical arrangement and compactness, the one exhibited in the English department by Messrs. Wheatstone. There are also harmoniums by Debain and Alexandre, both of Paris, exhibited in the English department; but, as they are evidently out of place there, being imported, and not the manufacture of this country, we cannot notice them, as we conceive the exhibition by English agents or importers of articles stated to be obtained only of them, but of foreign manufacture, to be quite opposed to the spirit and intention of the present Exhibition, which is professedly to show the comparative merits of each nation of the world in their several productions. There are a number of accordions from Austria, Prussia, and other parts of Germany, some displaying novelties of construction. One, in the Austrian gallery (No. 164), by Steinkellner, Vienna, is in the form of a guitar, with two octaves of keys, arranged the same as in a pianoforte. There are also some concertinas from Vienna; they are, however, far inferior to the English. In the Swiss department will be observed some highly-finished musical boxes from Geneva, some on a larger scale than has been before attempted, being much more powerful, and playing a greater number of tunes. One, by Gay and Lusprin, Geneva (No. 83), imitates a military band, and is a splendid specimen of the kind.

The show of brass wind instruments in the French department is exceedingly good, and the great number and variety exhibited would seem to indicate the *penchant* of our Gallic neighbours for anything of a military character, even to the manufacture of drums and trumpets. First and foremost, amongst the foreign exhibitors, is M. Adolphe Sax, of Paris (No, 1726), well known in England and on the Continent as the inventor and manufacturer of the Sax horns, so beautifully played by the Messrs. Distin. M. Sax has succeeded in giving to his horn a soft, full, clear, and musical quality of tone, which was before considered almost unattainable on that instrument; and, from being scarcely ever heard but in an orchestra or a military band, has, in the hands of the Messrs. Distin, became an agreeable variety in the concert-room. The instruments exhibited by M. Sax in the Nave, from the Sax horns and cornet-à-pistons to the immense trombones, are characterised by the greatest beauty and finish, as well as elegance of form. The kettle and side-drums are also fine specimens of those instruments. Leaving the Nave, and returning to the French Musical Department, M. Besson (No. 424) exhibits almost every species of brass wind instruments, of excellent make and construction: among them are two cornet-à-pistons of the most costly description and finest workmanship; one is of solid silver, and the other silver gilt. MM. Gauchot and Co. (844) exhibit a large collection of instruments of excellent make; and M. A. Courtais, sen. (130), wind instruments, with his patent curvilinear piston to replace into rectangular pistons, the workmanship of which is very good.

The other exhibitors, of whom we can only give the names, are M. A. Courtais (1163), M. Labaye (556), and M. Roth (933). Austria, after France, exhibits the greatest number of brass wind instruments; many of them are exceedingly good. They are principally from Vienna and Prague.

Belgium, Prussia, Bavaria, and the Zollverein likewise contribute a number of brass wind instruments, but they do not call for any special notice, as they certainly are behind the French and English in the construction and finish of their instruments.

In the English department (Class 10), the display of brass wind instruments is not very extensive; but in one or two instances it makes up in quality what it lacks in quantity. M. Kohler (540), well known in England and India as being one of our largest and first manufacturers of these instruments, contributes specimens of his patent valved wind instruments. They are distinguished by the highest character of workmanship, correctness of model, and elegance of form. The patent valves are an improvement on the old sort of valves, as, by diminishing the number of acute angles, less obstruction is offered to the passage of the wind, consequently producing a richer, clearer, and more even tone, and giving greater certainty and regularity to the notes, as well as offering considerable facilities for execution, by lessening the difficulty and exertion in producing them. M. Kohler has also introduced a spiral spring, in place of the watch spring, which was so very liable to break and get out of order.

Messrs. Pace and Sons (517) exhibit cornopeans and trumpets with improved valves, and without angular trimmings. Messrs. Pask and Kœnig (504), a variety of brass wind instruments. There are also several exhibitors from the provincial towns, among whom Mr. Oates, of Lichfield (520), puts forward some improvements. There are also others from Manchester, Birmingham, Dublin, &c.

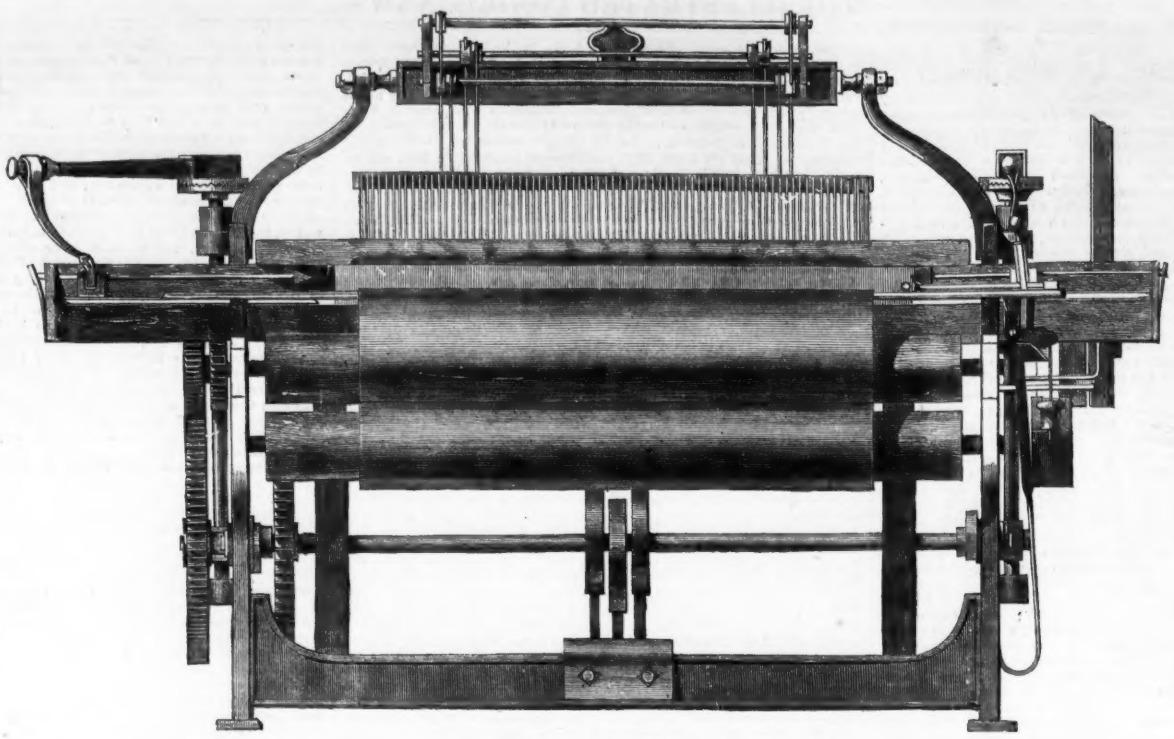
For the drums, we have already spoken of those exhibited by Sax. M. Augustus Knoche, of Munich (No. 100), exhibits a pair of mechanical kettle-drums, which can be altered in pitch either by the hand or feet, and with much greater ease and in less time than by the ordinary method. They have been used in the Royal orchestra at Munich for the last ten years. This certainly seems to be an improvement; the only objection appears to be in the greater weight in consequence of the iron framing, and the increased cost.

M. Rexer, of Stuttgard, Wirtemburg (25), also exhibits drums, to tune mechanically with screws.

In our next we shall notice the flutes, of which there are a great variety, with the improvements introduced by Boehm; and the violins, of which there are some fine specimens.

HARRISON'S IMPROVED POWER-LOOMS.

MR. HARRISON, of Blackburn, not only exhibits two modern looms, for light and heavy goods respectively, but also adds much interest to this part of the Exhibition, by placing, side by side with his improved machines, an old loom made about half a century since, at Abbey Mill, Paisley, and which is very similar to the power-looms at first worked in that district, in 1796, by Mr. Robert Miller, of Milton Prufield, near Dumbarton. This old contrivance was considered a wonder at the time of its introduction, although only capable of running *sixty picks* or throws off of the shuttle per minute, with advantage, besides requiring the constant attendance of one person. The new looms may be driven at the rate of 220 picks per minute, and are now working at that speed both in the Exhibition and also at the mills in the manufacturing districts.



HARRISON'S IMPROVED POWER-LOOM.

By the application of several improved motions, one person is enabled to attend to two, and in some cases three, looms at once. These motions are respectively known as the "weft protector," the "temple," the "positive taking-up motion," the "loose reed and break;" the first two of which motions have been patented by Messrs. Kenworthy and Bullough, of Blackburn; the loose reed and break by Mr. Bullough, and the fast reed and break by Mr. John Sellers, of Burnley.

The weft motion is a very simple and beautiful contrivance, consisting of a small fork which acts in connexion with the setting or handle of the loom; and whenever the weft thread breaks, or is absent from its place, the machine is immediately stopped by means of either of the above-mentioned breaks: it would otherwise go on weaving without weft, which would, of course, leave a part of the cloth unfinished, and thus the piece would be entirely damaged. This motion, therefore, dispenses with the very great care and watchfulness hitherto required on the part of the operator, and enables him to produce more cloth in a given time, thus benefiting both his employers and himself. The "temple" is a long semi-cylindrical box or trough, into which is fitted a roller, cut or fluted to nearly one-third of its length at each end, so as to give it the appearance of a file. The use of this roller, which rotates on the trough, is to keep the fabric at one uniform width throughout the piece, and the sides free from perforations and rents, thus giving the whole a more finished appearance than usual.

In the old loom, already referred to, is also a temple, but it requires the aid of the operator to move it: thus his utmost attention is needed, without which it might continue to move with the fabric until it would be of no use at all; moreover, it perforates, and very often tears the sides of the cloth.

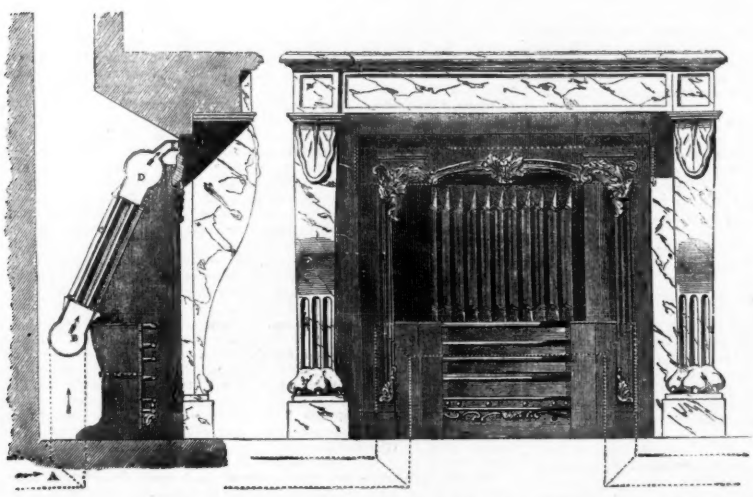
The "taking-up" motion is introduced for the purpose of ensuring uniformity of thickness throughout the piece, and regulates the number of threads of weft in a given space, by the application of a small wheel containing a certain number of teeth or cogs, acting in connexion with three other small wheels and the cloth beam, which latter at one and the same time folds up the cloth and moves it so as to ensure the desired thickness throughout; whereas, without its use, the fabric may present different thicknesses throughout.

The loose reed and break of Mr. Bullough is the most suitable for light fabrics, and the fast reed and break of Mr. Sellers for heavy goods. Whenever the shuttle fails in traversing the sley from one end to the other, a great destruction of threads is almost certain to take place in the ordinary looms; but in those to which Mr. Bullough's invention is attached the loose reed falls out at its place, and gives way to the shuttle, so that no derangement or breakage of the warp can take place.

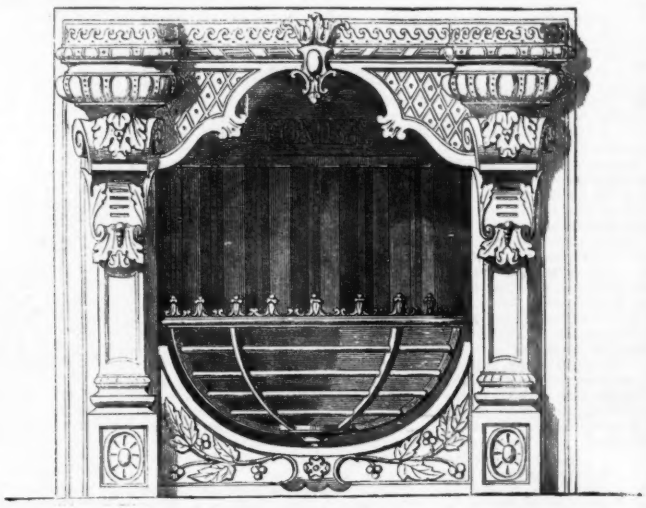
The above-named are the leading movements of the power-loom of the present day; but there are many other motions which are but little less effective to the complete and perfect working of the whole. By the old loom, which stands on the right-hand side of the two improved looms, not more than one-third the amount of cloth can be produced as compared with the workings of the new looms, although twice the amount of labour is required to produce the same quantity in a given time.

We understand that an experienced operative will produce 26 pieces, 29 inches wide and 29 yards long, of printing cloth of *eleven* picks per quarter inch, from two looms in a factory working sixty hours per week.

The weaving of each piece costs 5½d. The same person, if set to work at one of the old looms, could only produce four similar pieces, each of which would cost 2s. 9d. for weaving alone; thus an immense saving is effected by the new looms for weaving alone. With such facts before them, our readers will not be greatly at a loss to account for our vast superiority over all other nations of the globe in the production of every description of cotton fabrics.



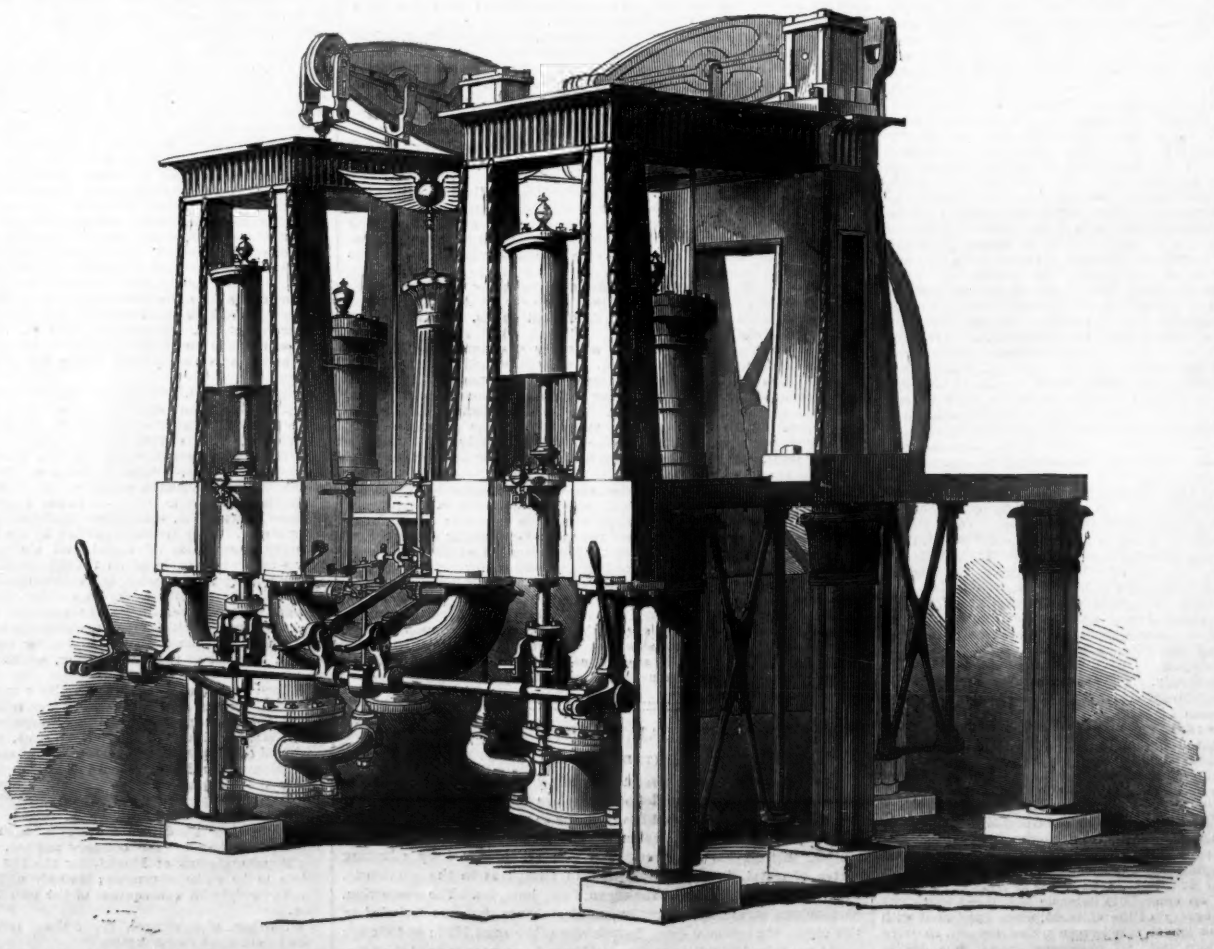
WARMING APPARATUS, WITH PRISMATIC TUBES.—BY FONDET.



WARMING APPARATUS, WITH CURVILINEAR TUBES.—BY FONDET.

TWO SPECIMENS OF WARMING APPARATUS, BY FONDET.

These are two specimens of stoves, in cast iron, by Fondet, of Paris; in one of which curvilinear tubes, in the other prismatic tubes, are introduced. The contrivance is ingenious, and will doubtless prove successful. The same manufacturer exhibits several contrivances for curing smoky chimneys, which are deserving of attention.



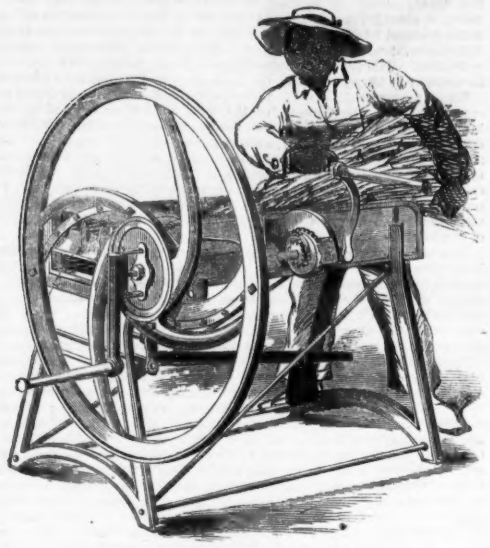
MODEL OF A STEAM-ENGINE.—BY HICKS, OF BOLTON.

NEWSPAPER

AGRICULTURAL IMPLEMENTS.

RANSOME AND MAY'S CANE-TOP CUTTER.

This machine is one of a number of valuable implements introduced by this eminent firm into the West Indies.

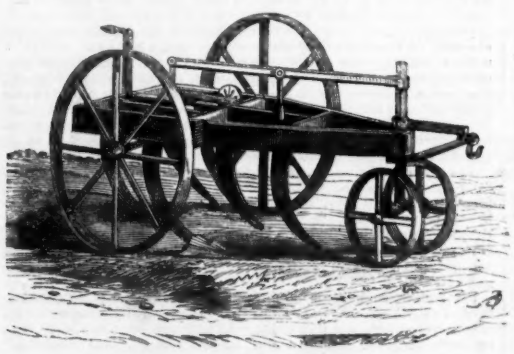


RANSOME AND MAY'S CANE-TOP CUTTER.

It is used for cutting cane-tops for cattle, and is in high repute there. It has two knives, and cuts the cane into lengths of half an inch. It can be worked by one or two persons, and is constructed in the simplest possible manner, requiring no particular skill on the part of those who use it. It is made entirely of metal, to avoid the inconvenience and damage which occur to machines constructed of timber.

LORD DUCIE'S CULTIVATOR.

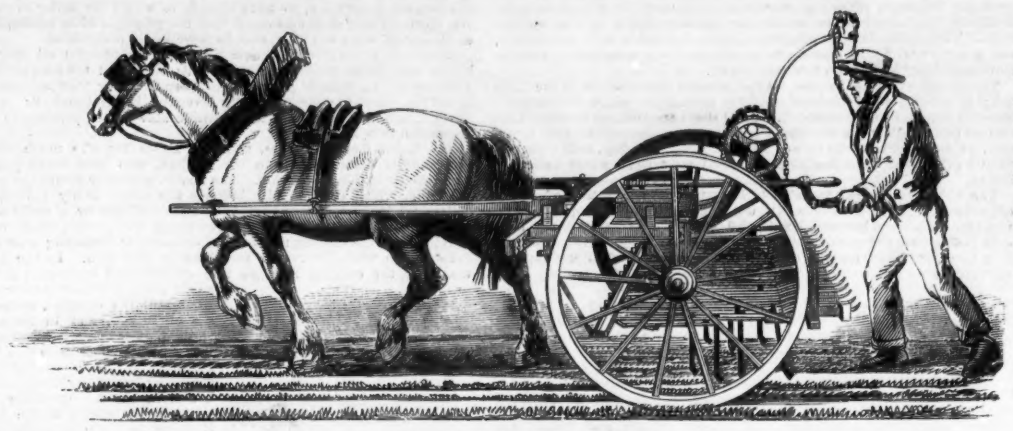
The introduction of this implement was a great boon to agriculturists, it enabling them to adopt a much higher state of cultivation at the same cost, as its strength and excellent action render it nearly equal to a second ploughing, while the labour attending it is not more than one-third. It is in this peculiarity that it differs from the machines of a similar description that preceded it: they all partook too much of the mere harrow character, and had no claims such as Lord Ducie's has to be called a cultivator. Their action was almost entirely confined to scratching on the surface, while the Uley implement disintegrates the soil to a considerable depth, and does actually in a short time, if constantly and properly used, quite change the character of the tilth. The mode in which it is raised out of the ground, and the plan by which its depth is regulated, was the invention of Mr. Clyburn, of the Uley works. The operation is performed with great ease, and the regularity and parallelism of the frame-work as it is raised or lowered is quite perfect. Our Engraving of this machine is as constructed by Messrs. Burrett and Exall, of Reading.



LORD DUCIE'S CULTIVATOR.

BARRETT, EXALL, AND ANDREWS' GORSE-BRUISER.—(SEE NEXT PAGE.)

GARRETT'S PATENT HORSE HOE.



GARRETT'S PATENT HORSE HOE.

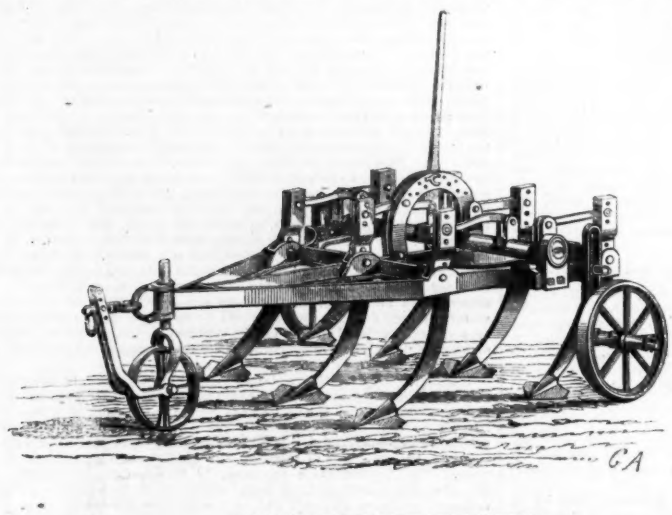
This implement is calculated to work an important improvement in field cultivation, as by its use corn of all kinds, drilled in rows of not less than 7 inches apart, may be hoed in a superior manner at a cost not exceeding sixpence per acre. It is adapted to all the prevailing methods of drill culture, either for cleansing crops drilled on the surface or on ridges, the axeltree of the wheels being moveable at both ends, to suit the varied intervals between the rows of plants; and as each cutting hoe works on a lever, independently of the others, the weeds are effectually destroyed, however uneven the surface of the ground, the hoes being kept a uniform depth by means of regulating keys. The steerage forms a valuable feature of the implement, as the hoes may thereby be guided with the greatest precision, perfectly hoeing the intervals without injury to the corn or plants. As much as from 10 to 15 acres per day may be hoed with one horse, a man, and a boy. The horse hoe offers particular advantage over hand hoeing, besides saving of expense, as the work may be performed at the proper time; and as the hoes penetrate a greater depth, fresh life and vigour are given to growing plants, by stirring the mould around them.

COLMAN'S DRAG HARROW AND SCARIFIER.

This is a modification of the Ducie Cultivator, and is an excellent implement as a drag harrow and scarifier, eradicating all weeds and rubbish from the foulest land: it is also efficient for opening, raising, and pulverising the soil; and with different blades fitted to the tines, it makes an excellent skim, to take off couch, &c.

The principal novelty is in the frame at the top being suspended about six inches above the lower one, parallel with which, by means of a lever, it is moved backwards and forwards: this motion regulates the depth of the tines in the soil, without having to lift the frame of the machine, which remains always at the same height from the ground.

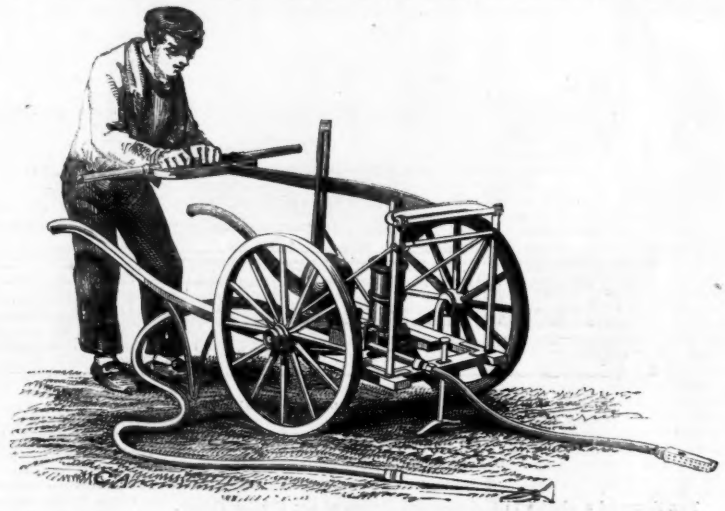
It is the invention of Mr. R. Colman, of Chelmsford, Essex, by whom they are manufactured.



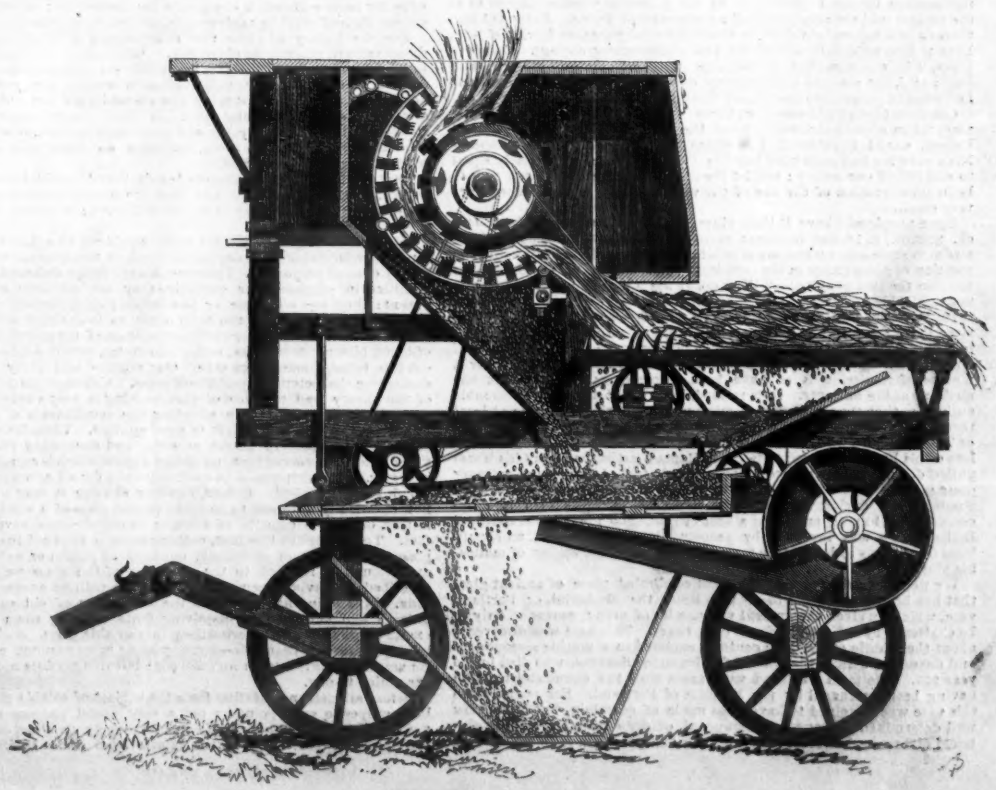
COLMAN'S DRAG HARROW AND SCARIFIER.

BADDELEY'S FARMER'S FIRE-ENGINE.

The frequent occurrence of fires in the agricultural districts has led Mr. Baddeley (whose name is well known in connexion with a variety of matters connected with the means of extinguishing and escaping from fires) to design a cheap and efficient engine adapted to the requirements of the farmer. It is exceedingly portable, as one man may move it from place to place. All the working parts are constructed to bear the roughest usage it may meet with on a farm, and any farm labourer may be taught in a few minutes how to use it. The valves are of metal, and not liable to derangement; but, should any obstruction occur, it can be removed instantly without disturbing any of the working parts of the engine. The branch-pipe is furnished with a spreader, by means of which the water can be made to act over a large surface, which is specially important in the event of fire in corn or hay-ricks, or weather-boarded buildings, &c. Worked by three men, the engine will throw a jet of water between 50 and 60 feet in height, and, from the great rapidity with which it can be brought up and set to work, it will be found more efficient in arresting the progress of the fire, than one of more powerful character at an advanced stage of the conflagration. Not the least part of the advantage to be derived from the machine, is the fact, that it will be equally useful as a liquid manure forcing-pump, and for a variety of agricultural purposes, as for the special object of extinguishing flame. They are constructed for the inventor, by Mr. Merewether, of Long-acre, which is a guarantee for their excellent workmanship and general efficiency.



BADDELEY'S FARMER'S FIRE-ENGINE.



GARRETT'S IMPROVED THRASHING-MACHINE.—SECTION.—(SEE NEXT PAGE.)

BARRETT, EXALL, AND ANDREWS' GORSE BRUISER.

The introduction of gorse as food for cattle is every day gaining ground. There are times and situations when gorse is a most valuable article to cattle-feeders, its nutritious qualities being of the highest class. Various noblemen and gentlemen have used it with advantage, and made a variety of experiments, always with satisfactory results, more especially with milch cows and sheep.

The great obstacle in the way of general introduction is the difficulty of getting rid of the hard points or prickles in which the nutritive juices of the plant are contained. Until these are entirely destroyed, no animal can swallow it; though, when they are destroyed, any horse, cow, or other herbivorous animal will eat it with avidity, and prefer it to any other food, even though the animal may have never tasted it before.

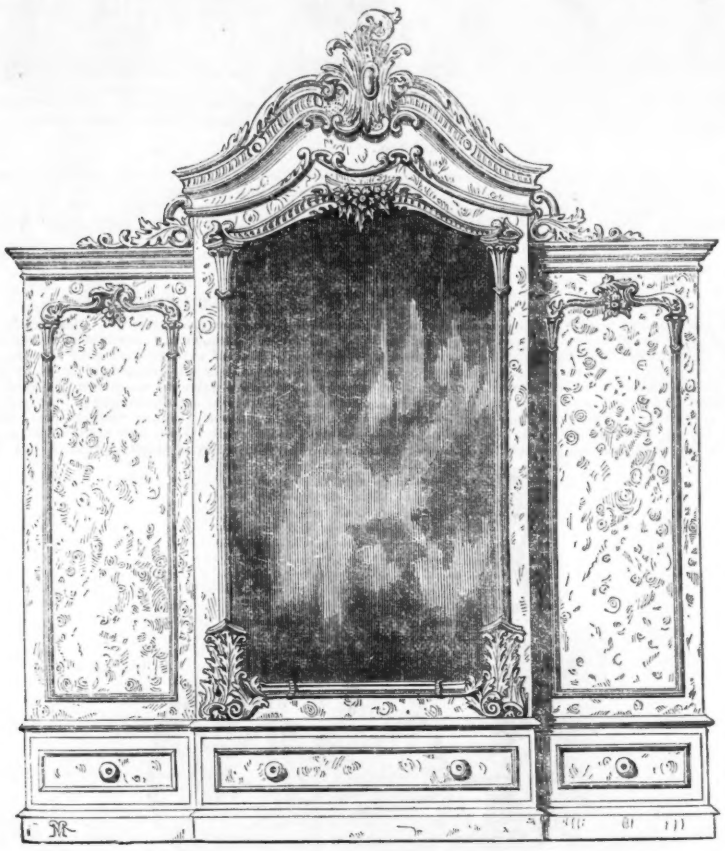
The old practice was to subject the gorse to the action of heavy edge-stones (as in a cider mill), until the introduction of a proper machine by Messrs. Barrett, Exall, and Andrews. This machine both cuts and bruises the gorse, and delivers it for use as soft and much like long moss, in which case, of course, any animal can eat it without inconvenience.

GARRETT'S IMPROVED THRESHING MACHINE.

As comparatively few persons are aware of the actual construction of the threshing machine, we have thought it would be better to engrave Mr. Garrett's engine in section, so that the principle of its action, as well as the detail of its working, may be more easily understood.

Threshing by machinery is now the ordinary practice all over England; every large farmer has one of his own, and the smaller holders hire one for the time of persons who keep them for that purpose. The threshing machine was originally invented in Scotland, by Andrew Muckle, and was used there for a considerable period previous to its introduction into England.

The Scotch machines were, and are, altogether of a much clumsier and heavier description than the English, who have much improved upon the invention of Muckle. The Scotch generally retain the original principle, which consisted in holding the straw firmly between two rollers, while the corn was beaten or scutched out by a series of bars, fixed transversely upon a drum, revolving with considerable velocity parallel with the feeding rollers, the concave or breasting part having little to do with the actual thrashing of the corn. In the English machines, the concave is made to play the most important part, the straw being fed directly between the drum and the concave, without the use of rollers, and in its passage through it is rubbed out, instead of being beaten out, as in the Scotch manner. The great objection to threshing by either of these machines has been the damage done to the straw by the action of the beaters, it being for some purposes, such as thatching, quite spoiled. To obviate this difficulty, Messrs. Garrett, of Leiston Works, Saxmundham, Suffolk, have succeeded in bringing into general use the one called a "bolting machine." In this, the straw, instead of being fed in endways, as in all the old machines, is admitted lengthways, and, in consequence, is not bent or broken in the least by passing through. We are not quite sure whether the Messrs. Garrett were the original inventors of the bolting machine; but, certainly, they deserve the credit of having brought it into general use. The latest improvements added to their machine, as shown in our engraving, are, 1st, the improved form of the breasting or concave, and the manner of adjusting the same to the drum; 2nd, a straw shaker, which receives the straw after it has passed through the machine, and clears it of all loose kernels that may be amongst it; 3rd, a vibrating screen for separating the loose ears, short straws, caving, &c., from amongst the corn and light chaff, the latter being driven off by a blast-fan while the corn is passing over the screen. After the corn has passed the various processes above described, it will be found free from all chaff and rubbish, and, once passing through a dressing machine, it will be fit for the market.



SIDEBOARD. BY WILKINSON.

SIDEBOARD. BY WILKINSON.

This sideboard, in walnut-tree wood and pollard oak, is remarkable for its good taste in the design, and simplicity in the ornamentation. It is not often we meet with a work so unexceptionably well finished, with so little attempt at meretricious display.

CHEMISTRY.

(THIRD NOTICE.)

THE thousand apologies to the presiding genius of the Crystal Palace, whoever she be, for our great neglect in having omitted to discuss the chemical properties of her temple's lucid walls.

Gold was described in our last paper; and so, according to all received notions of chemical order—notions which, perhaps, should not be lightly set aside, silver, the precious twin-sister of gold, ought to come next. Impressed with this opinion, our ideas went wandering into those up-stair regions of the Glass Palace, where shine in such ostentatious splendour the elegant products of the silver-working artizans. But suddenly a thought occurred, that glass should be our theme; accordingly, it is on glass we proceed to write.

Glass has become very common now—applied to purposes of such variety, that pages would not enumerate them all. Sparkling on our door knobs, adorning our coalscuttles, furnishing vases, goblets, mirrors, chandeliers; preserving sound and in good order liquids of almost every kind—from black draughts to champagne—from aqua-fortis to pump water. Ground into lenses, it reveals to us by the telescope the sublime immensities of the heavens; or by the microscope makes known to us the no less sublime revelations of minute created forms. Extended into threads and woven into cloth, it rivals the most gorgeous fabrics of silk. Drawn into wire, it furnishes the best chronometer springs. Cast into pipes, it bids fair to rival, for common purposes, earthenware, iron, and lead; and, not content with glazing our window-frames, it threatens hereafter to usurp the functions of bricks, slates, and tiles.

Common though glass be now, there was a time when any one single vase, taken almost at random from the glass treasures of the Crystal Palace, would have rivalled in value the Koh-i-Noor. The Emperor Nero gave for two cups with handles 6000 sestertii, a sum nearly equal to £50,000 of our money; nor let the reader imagine this large sum to be in consideration of the size of the vessels, for we are told they were very small.

Some people will have it that glass is spoken of in the book of Job, ch. xxxvii., v. 18, but it seems more probable that allusion is there made to some other transparent substance. Probably the first authentic mention of glass exists in the writings of Aristotle, who proposed for solution the two questions—"Why do we see through glass, and why is not malleable?" Theophrastus, who lived about half a century later than Aristotle, mentions the formation of glass from the sand of the river Belus; and from that period the manufacture of glass became tolerably well understood. Stimulated, we presume, by the question of Aristotle—*Why glass was not malleable?* the attempts to discover a method of rendering it so have been frequent, as well amongst the moderns as the ancients. It is related, indeed, but on very questionable authority, that the problem of forming malleable glass has been at least three times solved—once by a Roman architect, who lived in the reign of Tiberius, and who, as a proper reward for his genius, suffered the loss of his head; a second time by a Roman artist, who had his house pulled down by the populace because certain vested interests of ordinary glass makers were considered to be infringed; and a third time by a French artist during the reign of Louis XIII. Of this man it is recorded, that, having presented a bust of malleable glass to the Cardinal Richelieu, he was rewarded by perpetual imprisonment. A uniformly hard fate seems to be in store for all who work at the subject of malleable glass.

We need scarcely say that the most celebrated piece of ancient glass that has been transmitted to our own times the Barberini, or Portland vase, which survived the natural vissicitudes of many centuries, only to be shattered by a Vandal of our own times. This vase was discovered about the middle of the 16th century, enclosed in a marble sarcophagus and deposited within the tomb of Alexander Severus, who died in the year 235. The term Portland vase arose from the circumstance of its having been purchased by the Duchess of Portland. For many years this vase was imagined to have been made of porcelain, but it is now well determined to have been composed of deep blue glass. The chemical difference, however, between glass and porcelain is in reality very slight; hence we need not marvel at the fact that Mr. Wedgewood, the celebrated porcelain manufacturer, produced an admirable fac simile of this vase in his own material.

Glass for the purpose of making windows was first mentioned by St. Jerome, about 422; and a century later, we are informed by Paulus Silentiarus, it was employed in the church of St. Sophia at Constantinople.

Some will have it, that glass was made in our own island by the Druids long before the Roman invasion, but the assertion is very doubtful.

The first authentic mention of the use of window glass in Britain refers to the year 674, when, according to the venerable Bede, the Abbot Benedict sent for artists from beyond the seas to glaze the windows of the church and monastery of Waremouth, in Durham. The houses of the common people, however, were not furnished with glazed windows until the 13th and 14th centuries.

The following entry occurs in the minutes of a survey of Alnwick Castle, made in the year 1567:—"And because throwe extream windes the glasses of the windowes of this and other my lords castels and houses here in the country doth decay and waiste, yt were good the whole leightes of everie windowe at the departure of his lordshippe from lyinge at anie of his sade castels and houses, and dowring the time of his lordshippes absence or others lyinge in them were taken doune and lade up in safetie; and at sooch tyme as ether his lordshippe or anie other sholde lye at anie of the sade places the same might then be sette uppe for newe with smale charges to his lordshippe; whereas now the decaye thereof shall be verie costlie, and chargeable to be repayred."

For the history of glass this short sketch shall suffice; let us now direct our attention to its chemistry. Glass may be defined chemically to be a compound, transparent, uncrystallized siliceous salt. Yes, a salt is glass; and if, reader, this expression startles you, your surprise is not likely to be diminished when you are told that not only is glass a salt, but so are bricks and tiles. In short, the substance which constitutes flint, and rock crystal, and glass-making sand, is what the elder chemists called silex, or *silica*, but what we better informed people of modern times call *silicic acid*.

Now, silicic acid unites with potash, soda, lime, the oxide of many common metals, particularly of iron and lead, the results of which combinations are so many corresponding salts, called *silicates*; and these silicates are glass.

Silicic acid, unlike most other acids, combines or appears to combine (and the whole atomic theory is involved in the alternative) with bases in any desired proportion. These combinations are endowed with certain qualities in common: for example, they are all more or less transparent; they are all more or less fusible; and, instead of passing at once from the liquid to the solid state, as is the case with most other salts, they assume the intermediate condition of tenacious paste, capable of being blown into bubbles, rolled into plates, moulded into vases, pulled out into tubes, filaments, or wire. Our readers will easily now see the distinctive characterstic qualities of glass. Although the general outline of the theory and practice of glass-making is easy enough, much care and science are involved in adapting the constituents of glass to the numerous purposes to which it is now applied. Thus, for example, by employing an excess of potash or soda, and decreasing the amount of silicic acid or *powdered* flint, we obtain a glass which is completely soluble in water, and which would be evidently unfit for all common purposes to which glass is applied. Indeed, however strange it may sound to those not chemically informed to be told that the glass of a window-frame, or mirror, or vase is capable of solution in water—such, nevertheless, is a fact. To accomplish this feat, nothing more is required than to fuse the glass with a certain additional quantity of potash or soda; by which operation it is reduced to the condition of the glass we have already described as having been originally made with an excess of potash or soda. It was in this way that the alchemists of old surprised their patrons and admirers by dissolving flints. Fusing them with a large excess of alkali, they converted them into soluble glass. Modern chemists have gone further than this—nothing being more common now than the conversion of flints into an *invisible gas*; but this gas does not come under our notice to-day.

Before altogether departing from the subject of soluble glass, it would be improper to omit pointing out a very useful purpose to which one variety of soluble glass may be applied; namely, as a sort of incombustible starch, for protecting textile fabrics from fire. If fifteen parts of sand, ten of carbonate of potash, and one part of charcoal be melted together, a variety of soluble glass results, which, although soluble in hot water, is perfectly insoluble in cold. Used as a substitute for starch it is not affected by atmospheric dampness, and renders the fabrics which it has been employed to stiffen totally incapable of taking fire. Whether this compound present any special difficulties of manipulation, we are not practical laundress enough to determine. At any rate, its exceedingly valuable qualities should not be lightly forgotten.

The varieties of glass used in the arts are exceedingly numerous, and are distinguished by marked chemical characteristics. As great precision in classification is not so much our object in writing these papers as an attempt to sketch broad outlines of the subjects which come within our sphere, it will suffice for the present to divide glass into coloured and colourless. The latter we may consider as the basis of the former, just as water may be regarded as the basis of numerous coloured solutions.

Many persons will have, doubtless, remarked the frequent use made by our neighbours, the French, of the term *crystal* as applied to certain kinds of glass, which are employed for the purpose of making goblets, vases, cut ornaments, and, in short, all objects where pure colourless transparency is required. This designation, *crystal*, corresponds to the English expression, *flint glass*; an expression so far wrong, that the peculiarity of such glass depends, not upon flint, but upon *oxide* of, or *red lead*, a material which, when added to silicate of potash or soda, renders the glass more purely transparent, refrangible, and, at the same time, softer than it would otherwise be.

The art of making coloured glass is now brought to great perfection in England and France, as well as Bohemia, and involves some of the most delicate appreciations of chemical science. We will rapidly announce some of the chief substances employed in communicating the various tints. First, then, the exquisite ruby red, now so great a favourite for our ornamental vases, is communicated by minute portions of oxide of gold, while other qualities of red are communicated by oxide of iron and copper. The dead, opaque, or milk-white hue which we find imparted to some glass forms, almost assimilating them in appearance to porcelain, is communicated either by an oxide of arsenic or tin; shades of purple are given by manganese; and the opalescent yellow, so much admired, by an oxide of uranium. Most of these substances are exceedingly valuable, and their employment so generally is only rendered practicable by having recourse to the process termed by glass-makers *flushing*, namely, dipping a solid bead of white glass into a fused mass of coloured glass; then, blowing the former into a bubble, the latter coats it to a very thin extent. The operation of flushing may be compared to the veneering of one wood on another, and gives an almost infinite power of colour-ornamentation to the glass artist. Thus, by grinding off the outside coating of coloured glass in definite shapes, we have the white glass foundation showing through, and by dipping the white glass foundation into two or more consecutive baths of different coloured glasses, and carrying the grinding operation to various depths, an almost boundless variety of ornamentation may be commanded.

The art of employing coloured glass for the construction of Gothic ornamented windows is of tolerably ancient date. Probably the origin of this art must be attributed to the Romans of the Eastern empire, and probably they communicated it to the ecclesiastics of northern and western Europe. At various periods, the art of pictorial glass illumination has undergone changes of style and mode of execution, giving rise to various distinctive schools of art, on which it is not our province to touch. One remark, however, applies to all ancient windows of coloured glass; and it is this:—Although in power of grouping, drawing, and form, modern coloured glass windows have excelled their prototypes, the latter are pre-eminently superior in general harmony of colouring and tone. This fact is the more to be wondered at, seeing that chemistry and mechanism have largely added to the resources of the modern glass maker. For instance, the coloured glass-maker of the middle ages was unacquainted with the magnificent ruby red produced by gold; and in those days the surface of glass, of whatever colour, was devoid of that smooth polish which we, at this period, invariably find. On this point, a celebrated modern glass-maker asserts that it is chiefly to the latter cause, the exceeding smoothness of surface, that the artistic inferiority of modern coloured glass windows is chiefly owing; and his remark is so far consonant with analogy, that we know the impossibility of executing a water-coloured drawing characterised by any high degree of excellence on a smooth-surfaced paper: on the contrary, as the power and ambition of water-colour painters expand, so do they employ papers more and more rough.

Whatever may be the ultimate form into which it is designed to fashion glass, there are only two general methods of elaborating it into shapes: the first is by the process of *casting*; the second, by that of *blowing*. What is termed commercially plate-glass, is the result of casting and polishing—processes that we will presently describe. Plate-glass is used for the better sort of mirrors, and windows of large and expensive houses; but, beyond these purposes, its uses are circumscribed. The non-chemical reader will, perhaps, marvel to be told that the glass of ordinary windows, although flat, is not plate-glass: neither is the glass employed in the construction of the Crystal Palace; both these are blown or bubble glasses, though resulting from two separate processes of manipulation. First, we will describe the process of making window-glass, then the glass of the Crystal Palace. As a serviceable association of ideas is most useful in conveying information, we will not hesitate to avail ourselves of its aid. Has the reader never seen a glazier's man walking through the streets with a collection of awkward semi-circular pieces of glass on his back, each piece furnished with a thick lump, technically called a bull's-eye? Has the observer never asked himself the question why, seeing that window-frames were square, glass out of which they were to be cut should be made round, or semi-circular, and still further deteriorated by the presence of the useless bull's-eye? These imperfections (for imperfections they must be called) are an inevitable necessity of the method by which window-glass is made. It was originally a bubble. The bull's-eye is the thick part where the bubble was attached to the workman's iron blow-pipe, and the ultimate form of the glass—viz. a circle—results from the gradual opening of the bubble, on being violently rotated, after an orifice has been made at the part farthest from the bull's-eye. Thus, window-glass is turned out by the workman in the form of a circle; and, for convenience of package, it is subsequently cut into two unequal parts.

The glass employed for the construction of the Industrial Palace is called sheet-glass, and, although constructed from a bubble, the manufacture is different from that already described. First of all, a round bubble being created, the workman by a dexterous swing elongates the bubble into a cylinder, which cylinder having both its extremities cut off, and being laid open by a longitudinal incision, is allowed, whilst yet pasty, to flatten on a hot iron plate, by which means a sheet of glass results.

Plate-glass, such as is used for mirrors, is formed by pouring the melted substance on a flat metal table, and rapidly passing over the mass a very heavy metallic roller. As thus prepared, the plate is rough on both surfaces, and does not acquire the brilliant smoothness of plate-glass until it has been subjected to the tedious and expensive operation of polishing.

Glass polishing is thus conducted: the plate of glass, rough and wavy as it appears when first lifted from the metallic table whereon it was cast, is now cemented on to another table by means of plaster of Paris, and sand having been scattered over its surface another piece of glass smaller than the first is placed upon it; sand again is scattered upon this, and a third piece of glass superimposed. In this way the operation of glass plling is continued until a sufficient number of plates have been thus arranged, when, by means of machinery, a motion of friction is imparted to the whole, until a sufficient portion of the uneven surface has been removed. The result of this operation is the production of glass which, although even, is rough—ground glass, in fact. The next step consists in applying friction, aided by a material less rough than sand, emery being for this purpose the substance employed. Still the glass is not quite smooth until the ultimate finish has been given by friction, with colcothar and putty powder.

The chief use of plate-glass is for mirrors, which are formed by covering the back part of the plate with an amalgam, or a combination of quicksilver and tin. Lately there has been introduced, however, another method of imparting to glass a metallic surface, real silver being employed instead of quicksilver. This process is more especially applicable to the silvering of globes and other curved vessels, with small orifices, for this operation depends on the property which certain solutions of silver have to deposit their metal in a thin coat: hence, wherever we can pour a solution we can cause this silver coat to be deposited, whereas, by the old process of mirror-making we effect our purpose by smearing or painting a layer of tin foil with quicksilver, and then pressing it tightly down on the glass.

From glass polishing the transition is very easy to glass cutting, which, indeed, should be called grinding and polishing too. When writing about the diamond, we remarked that the term cutting, as applied to these gems, was inappropriate, and we adduced our reasons for the objection. Now, just as inappropriate is the term as applied to the

operation on glass. Glass, like diamonds, is cut, as the term is, by means of a rotating wheel; but there is this difference between the two operations. Friction, in the case of diamonds, is given by the flat part of the wheel, whereas it is the convex portion of the wheel which is employed in glass cutting operations. In fact, the process is precisely similar in appearance to knife grinding.

It is by this operation that the beautiful facets are produced on drinking-glasses, lustres, vases, and, indeed, the large variety of articles known under the general appellation of cut-glass.

We have thus rapidly sketched the leading process of glass manufacture: much more might be said, for the subject possesses extraordinary interest, but we have already overstepped the limits to which, mentally, we had desired to restrict our remarks.

THE MACHINERY IN MOTION.

IT is allowed by most persons, whose opinions in such cases are worthy of respect, that the British machinery presents by far the most important feature of the Great International Exhibition. And what a different aspect would have been presented in this department but for the mighty aid of steam. Indeed, when we look around at the countless objects of arts and industry dispersed throughout the Building, which have been chiefly produced by the power of that wonderful agent, we may safely assert that but for the steam-engine, the Exhibition of 1851 would never even have been thought of. In drawing the attention, therefore, of our readers to the numerous machines in motion, which are actuated by a great variety of steam-engines, interspersed with the various manufacturing and other machines occupying a large area at the north-west portion of the Building, it may be as well in the first place to call to mind as briefly as possible the early history of the steam-engine, in order to show by what progressive steps it has arrived at its present almost perfect form. The origin of the application of steam as a prime mover is due to the Marquis of Worcester, who, while incarcerated, in the reign of Charles II., was one day struck forcibly with the power of steam, as evidenced in the case of the lid of his tea-kettle being raised up with great violence by the action of the steam; and that ingenious nobleman, who, in 1663, published his "Century of Inventions," describes his *sixty-eighth* invention thus:—"This admirable method which I propose of raising water by the force of fire has no bounds, if the vessels be strong enough, for I have taken a cannon, and having filled it three-fourths full of water, and shut up its muzzle and touch-hole, and exposed it to the fire for twenty-four hours, it burst with a great explosion. Having afterwards discovered a method of fortifying vessels internally, and contrived them in such a way that they filled and acted alternately, I have made the water spout in an uninterrupted stream 40 feet high; and one vessel of rarified water raised 40 feet of cold water. The person who conducted the operation had nothing to do but turn two cocks, so that one vessel of water being consumed another begins to force, and then to fill itself with cold water, and so on in succession."

As in the case with so many inventors in our own times, so with the Marquis of Worcester nearly 200 years ago. He was wholly neglected, and, no doubt, by many despised, while others would consider him as a wizard, and unfit to be loose. The valuable experiments which this extraordinary nobleman had carried out as illustrative of the gigantic power of steam were entirely lost to the world for a long period, until, towards the end of the century, Captain Savary, well known at the time for his scientific acquirements, paid considerable attention to the expansive force of steam, and subsequently invented an engine for raising water by the power of that elastic fluid, for which he obtained a patent.

The French are apt to boast of their countryman, Dr. Papin, on account of his *Digester*, as the inventor of the steam-engine. It is quite possible, however, that the two philosophers were simultaneously engaged in their investigations with regard to the properties of steam.

Savary's machine consisted of two copper vessels—the one a boiler, the other a receiver—which were connected together by a pipe at the top, the pipe being furnished with a steam-cock for the admission of the steam into the receiver. A second pipe passed from the bottom of the receiver to a third pipe placed vertically, and passing from the well to the delivering cistern. Two valves were fixed in the well-pipe, one just below the entrance of the connecting pipe from the receiver, and the other just above it. The contrivance was completed by a fourth pipe communicating between the well-pipe and the upper part of the receiver: this pipe was also furnished with a cock, the key of which was connected with the steam-cock by means of a handle called a regulator. The boiler being charged with water, and a fire made beneath it, the water was made to boil, and the steam thus generated passed into the receiver, gradually warming it. When the condensation ceased, the steam passed into the rising-pipe, the lower valve remaining closed by its own weight, while the upper valve was raised by the pressure of the steam, and thus the vertical pipe was warmed. Both cocks being then closed, the steam in the receiver returned to water, and the pressure of the atmosphere on the water in the well forced it up through the lower valve, and caused it to fill the receiver. The cock being opened, and the steam in the boiler having acquired considerable elasticity, forced its way, with great violence, on the surface of the water in the receiver; thus pressing down the lower valve, and lifting the upper valve; and thus raising the water to the top of the vertical well-pipe, and delivering into the reservoir at top. By opening the injection cock, steam in the receiver was again condensed, and the action already described repeated. Several engines on this construction were erected, under the direction of Savary—especially in Cornwall, where their use for raising water from the mines was of great value.

The next improver of the steam-engine was Newcomen—said to have been a smith—who, having paid considerable attention to Savary's engine, hit upon some important improvements; and in 1705 took out a patent for the same, in conjunction with Savary and another. One of Newcomen's principal improvements was the introduction of the cylinder and piston, which he placed above the boiler; a communication between the boiler and cylinder being effected by means of a steam-pipe at the lower end provided with a cock or regulator. The piston was suspended from one of the working beams, while to the other end of the same beam was hung the pump-rod by which the water was raised from the mine by the extra weight of the latter; but with a vacuum beneath the piston, caused by the injection of cold water, the downward stroke of the piston was produced, and thus the alternating motion ensured. The various cocks, however, of the engine required constant attention and vigilance on the part of the manager, without which serious accidents were likely to take place. This machine was manifestly a great advance on that of Savary; which latter was actuated partly by steam and partly by the atmosphere, while Newcomen's engine raised water by the action of the atmosphere, the steam being required only for producing a vacuum in the cylinder.

By the year 1712, Newcomen's engine had received many important improvements, in order as far as possible to prevent accidents from the possible inattention on the part of the person in charge of the cocks.

The next improver of the steam-engine was Beighton, who, seeing the disadvantageous arrangement of the various cocks in Newcomen's engine, and the liability to accident by the slightest inattention on the part of the manager, contrived a plan by which the opening and shutting of the cocks was effected by a self-regulating apparatus in the shape of a piece of timber called a *plug-beam*, which was attached to the working-beam, by which addition motion was communicated to the various levers and forks by which the several cocks were opened and closed.

The cost of fuel in most parts of the country operated powerfully against the general introduction of the steam-engine; and the desire which naturally existed on the part of those interested in the economy of fuel, caused them to pay considerable attention to the construction of the boilers.

About 1763, the celebrated James Watt, at that time a mathematical instrument maker in Glasgow, having to repair the working model of a steam-engine, had his attention closely drawn to the nature and properties of steam, and strove to devise some plan by which to economise heat contained in the steam generated in the boiler. At first he made trial of wooden cylinders, but which, for obvious reasons, were objectionable; he then covered externally metallic cylinders with a casing of wood, which proved to be a most valuable improvement in the steam-engine. In the model of Murdock's oscillating engine, which we described and illustrated a few weeks back, and a model of which may be seen close to the large marine engines of Messrs. James Watt and Company, in the Exhibition, the cylinder is clothed externally with wood; and the same precaution may be observed in one or two other engines exhibited. The next improvement effected by Watt was the addition of his condenser. His first experiment with a view to improved condensation, was made with a metallic globe immersed in cold water, and connected with the bottom of the cylinder by means of a pipe furnished with a stop-cock, by opening which at proper intervals a regular condensation was effected.

The great step, however, in the invention of the improved steam-engine made by Mr. Watt was the use of steam above the piston, instead of the pressure of the atmosphere, which had hitherto been applied. The lower end of the cylinder being connected with the boiler, the upper end was connected with the condenser, for the purpose of producing the necessary vacuum, first on one side of the piston, and then on the other. From the improvements and alterations which Mr. Watt effected from time to time, he in 1782 produced his double-acting engine, which has been extensively used ever since. The same ingenious person tried many plans for producing direct rotative engines; but, owing to various difficulties which presented themselves, he was compelled to abandon them, and then turned his attention to connecting the reciprocatory motion of the steam-engine, so useful for pumping, into a circular motion for various other purposes to which the power of the steam-engine has since been applied. The crank which had been so long in use, unconnected with the steam-engine, occurred to his mind; but a patent for its application to the purposes already mentioned had already been taken out by a workman engaged by a Mr. Wasbrough in the construction of his engine, so that Mr. Watt was obliged to resort to some other mode of gaining his object. The result was the introduction of the sun and planet-wheel motion, which was applied to several of Watt's engines; but the crank being on many accounts preferred, the sun and planet-wheel motion got into disuse. Thus we have traced the steam-engine from its origin to the time of the illustrious Watt, in whose hands it became almost a perfect machine. The number of persons who have, from time to time, made improvements, alterations, and modifications in several parts of the steam-engine, is very considerable; and, even within the last few years, a variety of new engines in modified forms, many bearing the distinguishing characteristic of simplicity about them, have been introduced to the mechanical world, a large portion of which have found their way to the Great Exhibition.

Before drawing the attention of our readers to the various engines exhibited, it may be proper to introduce the names of those whose machines have been considered worthy of a place in the World's Fair. Commencing, therefore, at the west end of the Machinery in Motion department, we first find the familiar name of Hick, of Bolton; then, proceeding nearly in the order in which the other engines are placed, Edwards, of Birmingham, stands next; then follow M'Naught, Simpson and Shipton, of Manchester; J. and G. Davies, of Tipton; W. Joyce, of Greenwich; Lynch and Inglis, of Manchester; W. E. Carrett, of Leeds, whose engine has only lately been introduced; W. Fairbairn and Sons, of Manchester; Andrew Shanks, Hodge, and Co., of London; Penn, of Greenwich; the Butterley Company; Evans, of London; Hawthorns, of Newcastle and Leith; E. Lloyd, Bishop, Pope, and Bessemer, respectively of London; Nasmyth and Co, of Patricroft; Maudslays and Field, of Lambeth; Bryan Donkin and Co., of Bermondsey; Clayton, Shuttleworth, and Co., of Lincoln; Middleton, of Southwark; Hopkinson and Cope; Manlove and Co.; Bunnett and Co., of Deptford; Barrett, Exall, and Andrews, of Reading; W. Crosskill, of Beverley; Robinson and Co., of London; and Collinge and Co., of Lambeth. Thus we find that there are 31 steam-engines exhibited, all of which, however, are not employed in communicating motion to other machinery. The aggregate power of all the steam-engines exhibited in motion amounts not quite to that of 150 horses; while a single locomotive engine is of four or five times the power. The steam to work these several machines is generated in the boiler-house, which is considerably removed from the Building, being situate nearer to Kensington Gardens. It was considered quite necessary to take this precaution, on account of the liability to fire, which, if communicated to the valuable articles within the Building, would have caused an irreparable loss to many of the contributors.

We have already given some account of the boiler-house, and the particular kind of boilers and furnaces set up within that building; and in No. 479 will be found a view of the boiler-house, previously to that part of the Exhibition establishment being completed. We are now, through the intelligence and willingness of the superintendent of the boiler-house and pipes, enabled to introduce additional interesting particulars. In the description we formerly gave of the building containing the boilers, only five boilers were mentioned; but, owing to several engines being added to the collection since the opening, on the 1st of May, it was found necessary to increase the supply of steam, so that now we find altogether eight boilers, the three new ones being furnished by Mr. Armstrong, of Newcastle, who is well known as the inventor of the hydraulic crane. The distance from the boiler-house to the Great Exhibition Building is rather more than 150 feet, and the extreme length of the main line of steam-pipes, which are placed in a channel constructed under the flooring of the north passage of the Machinery in Motion department, is 1000 feet, so that the extent of main supply pipes within the Building is equal to 850 feet. Leaving the boiler-house, the internal diameter of the pipes is 8 inches for a length of 189 feet, then 6 inches for 383 feet, and, lastly, 4 inches for 428 feet; the last British engine supplied from the main being that of Messrs. Hawthorn.

The branch pipes amount altogether in length to 3600 feet, varying from half an inch to two inches in diameter. All the steam-pipes throughout are clothed with a thick coating of felt, for two specific objects, the one being that of economising steam, and the other that of keeping down as much as possible the temperature of the atmosphere, which sometimes, notwithstanding the attention which has been paid to ventilation, is oppressively hot: the worst part of the whole, however, is the nauseous effluvia arising from the soddened felt, which takes place when by any mischance there is an overflow of water, which fills up the channel to about the level of the pipes. The exhaust pipe from each engine runs into a tunnel carried under ground without the boundary of the Building: the tunnel is 18 inches wide, and 24 inches high to the soffits of the arch; and the steam entering the tunnel from the various exhaust pipes is to a very considerable extent condensed, thus leaving but little steam, and that in a very attenuated state, to escape from the chimney, which stands outside the Building at about mid distance between the two extremities of the tunnel. The fuel used for the production of steam is the stone coal, or anthracite, from the South Wales field, where there is an almost inexhaustible supply. The consumption of anthracite in the eight furnaces daily is found to be about 9960 lb., or 1245 lb. to each furnace; the cost thereof for the fuel consumed, at 25s. per ton, is equal to £5 a day, or £30 a week.

In addition to the superintendent of the Boiler-house department, there are only three stokers to attend to the furnaces.

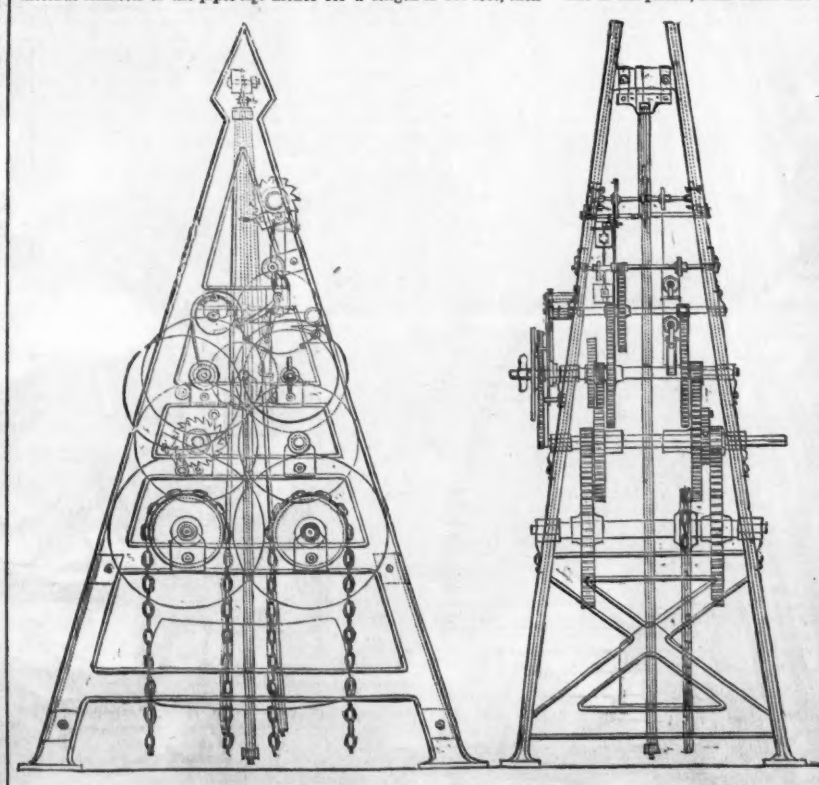
It is a curious and highly interesting fact, that, from the boilers to the extreme end of the main steam-pipe, a distance of 1000 feet, there is only a diminution in the value of the steam of 4 lb.; thus, when at the boilers it is at 40 lb., at Hawthorn's engine, already alluded to, it is found to be 36 lb.; the same difference being observed when the steam is either at a higher or lower pressure at the boilers.

We now come to the particular engines contributed by those whose names we have already mentioned, and, following the same order in which their names are registered, we will proceed to give some particulars as to each engine in turn: thus, the cotton machinery of Messrs. Hibbert, Platt, and Co., of Oldham, of which we this week give an illustration, is driven by one of Messrs. Hicks and Son's engines, which is direct-acting, having a vertical cylinder of 9 inches diameter, with a stroke of 18 inches, and it is estimated at six-horse power. The cylinder is chiefly placed below the pedestal, the crank being above the cylinder; and on the crank shaft is a large cog-wheel, which works into a smaller wheel of the same kind, having 57 cogs; and which wheel is fixed on the first or main shaft, from which, by means of pulleys and straps, a second shaft, parallel to the first, is set in motion, and also auxiliary shafts running at right angles to the first-named. By the two parallel shafts motion is given to six carding machines, a single scutcher and lap machine, an opening and cotton-cleansing machine, a slubbing machine of 28 spindles, a second slubbing or intermediate machine of 54 spindles, a drawing machine, and a grinding machine: while by the shaft at right angles, and its accessories, the following machines are put in motion; viz. a roving machine of 120 spindles, a weft self-acting mule of 402 spindles, a twist self-acting mule of 348 spindles, a doubling machine, a winding machine, a throstle of 160 spindles, besides four power looms; the whole of the above belonging to Messrs. Hibbert, Platt, and Co. There are altogether six drivers and 32 pulleys in the above machinery.

In addition to the above, Messrs. Hicks' engine also actuates Crabtree's card-setting machine, one of the prettiest and most interesting contributions in the Building, which attracts a large number of visitors daily. As in all the most perfect machines, so in this, the natural motions of the human frame have been strictly copied, thus giving an additional charm to its operations. The fine wire of which the card is partly made, is drawn out from the reel on which it has been previously wound, cut off to the exact lengths required, removed by two artificial fingers placed in punctures already made by another elegant contrivance, and finally the ends of the wires passed through the tape are turned down at the proper angle, thus completing the operation, and placing the wires on the tape with a degree of nicety and precision truly astonishing. A complete history of this little machine—from the raising the coals from the bowels of the earth with which to smelt the ore, to the finished card—would form one of the most interesting volumes in connexion with machinery that it is possible to conceive.

On account of the distance of the American department from the boiler-house, it was quite impossible to put the machinery of the United States in motion within their own boundary. Those, therefore, that were required to be shown in action were removed to a space allotted for the purpose at the east end of that occupied by Messrs. Hibbert and Co. The direct-acting engine of Mr. Edwards is called into requisition for the purpose of driving Gwynne's centrifugal pump, the American stone-dressing machine, the bookbinders' embossing-machine, the wood-planing, tongueing, and grooving machine, by J. P. Woodbury, of Massachussetts; and Dick's iron shearing-machine. Edwards's engine has a 7-inch cylinder and a 15-inch stroke, and in the first place gives motion to Gwynne's centrifugal pump, which, as this kind of machine has created great interest in the Exhibition, we shall briefly describe. We have already directed the attention of our friends to Appold's centrifugal pump, which continues to attract as much attention as ever. The other two pumps on the same principle are those of Bessemer and Gwynne: to the latter only we have now to direct attention. Mr. Gwynne calls his invention the Direct-acting Balanced Centrifugal Pump. The discs of the piston of Mr. Gwynne's pump are of concave form, the hollow parts being placed immediately opposite to each other. An impeller, radiating from a boss or hollow axis, is fixed between the two discs, and mounted on a shaft, which may either be placed vertically, horizontally, or at any given angle that may be required: the narrowest part of the impeller is at the outer edge of the piston, increasing gradually in width until its edge intersects the inner surface of the opening in the suction side of the piston, from which line to its extremity at the boss its edges are parallel to each other, and at right angles to the axis of the shaft. An annular opening is left all round the circumference of the discs, the area of which is equal to that of the opening for the admission of water to the piston through a circular aperture in one of its sides. The piston is enclosed in a case of circular form, fixed parallel with the discs; and this case may be called the receiver, the area of which ought to exceed both that of the discharge pipe and that of the annular peripheral opening, so that a continuous flow of water may be ensured: the space between the sides of the piston and the exterior of the case is equal to that of the annular opening.

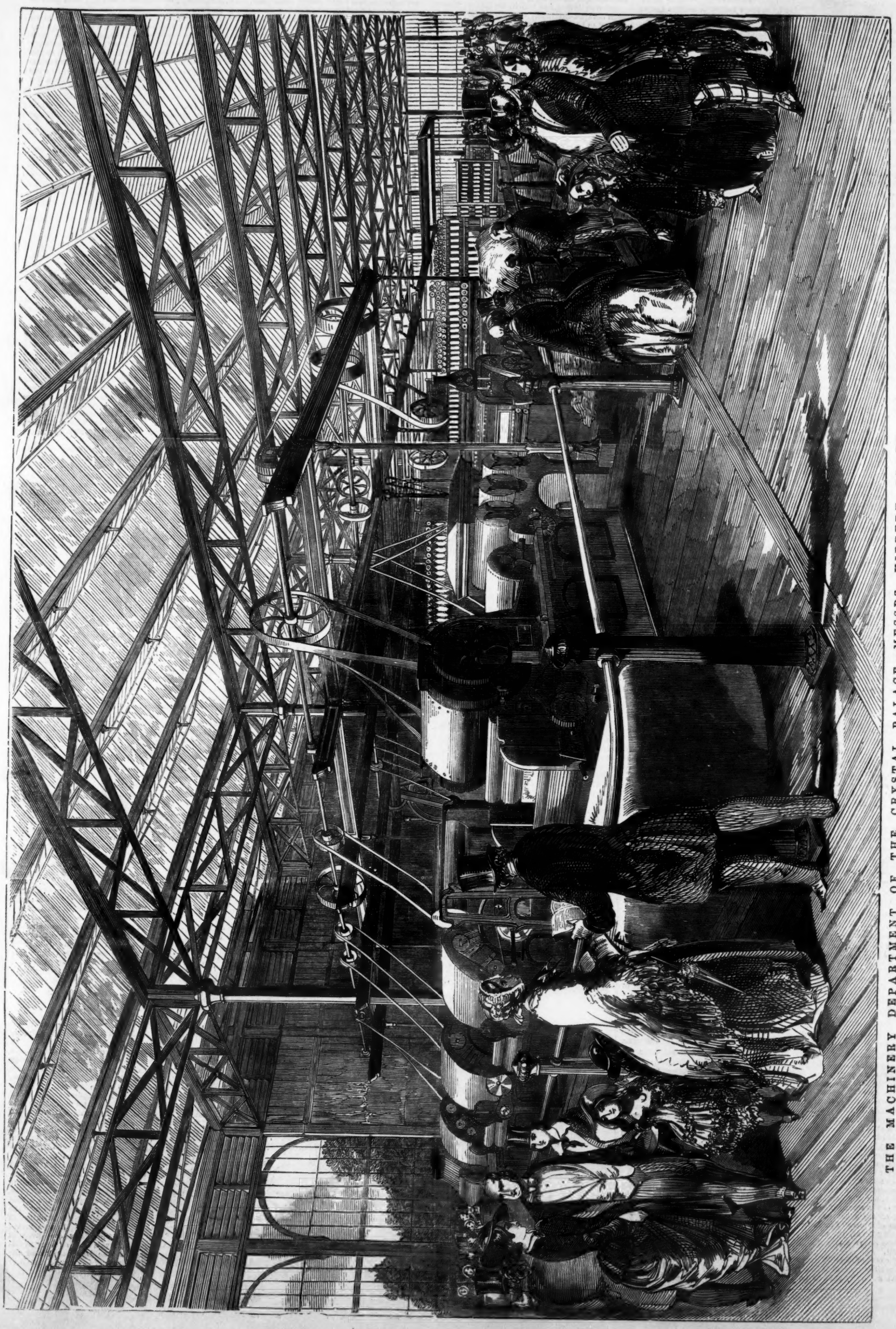
(To be continued.)



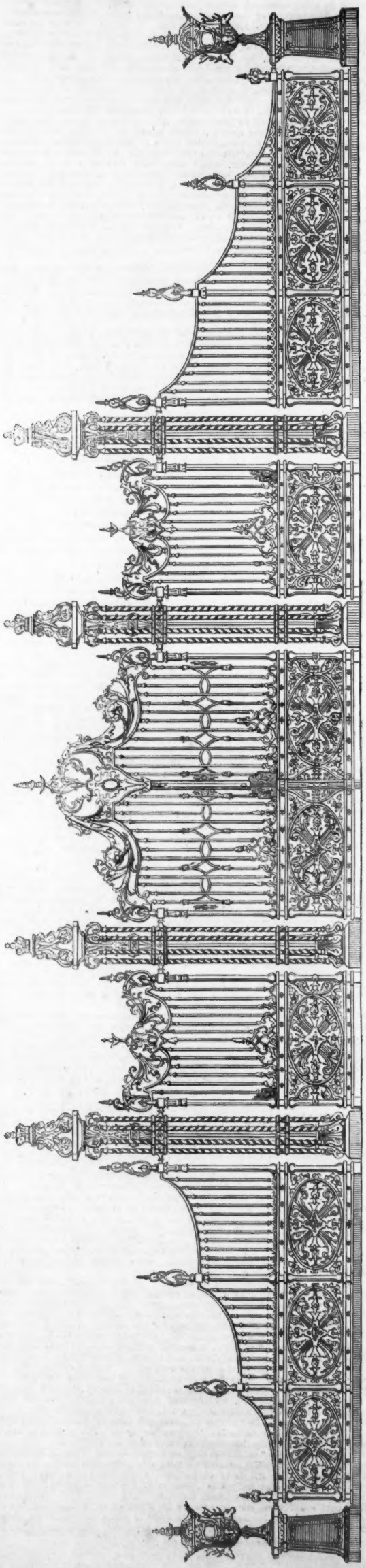
THE ALPHA CLOCK.—BY ROBERTS.

THE ALPHA CLOCK. BY ROBERTS.

Roberts's Alpha Clock has already been mentioned in an article on Horology, in a former Number. It may be convenient, however, briefly to describe its principle of action here. It is called the Alpha Clock, from its shape resembling an A. The wheels and pinions are made of cast iron, with teeth retaining the scale. It has only one weight to actuate both the going and striking trains; and the chain or cord, requiring no lateral traverse, can be taken off in any direction. The pendulum (compensation) and the escapement (remontoire) are adapted to keep the clock at an almost uniform rate; whilst the hands, being advanced at intervals of thirty (or, if preferred, sixty) seconds, afford opportunity for ascertaining the time to a second. The striking of the hour is effected through means by which the blows are given at equal intervals of time, thus avoiding both the irregularity and the expenditure of power to direct it.



THE MACHINERY DEPARTMENT OF THE CRYSTAL PALACE.—MESSRS. HIBBERT, PLATT, AND CO.'S COTTON-MACHINES.



BRONZED GATES.—BY THE COALBROOK DALE COMPANY.—(SEE PAGE 252.)

CARVED FONT. BY MARGETTS AND EYLES.

The workmanship in this elaborate production, which is in Caen stone, is such as leaves us no room for complaint. It is unexceptionably neat and smooth. The style of the composition, however, is of the very thick of mediæval absurdity, and demands unqualified disapprobation from those who are anxious for the advancement of art, and the principles of rational poetry upoa which art should be founded.

NYMPH OF LURLEIBERG.—BY ENGELHARD.—(SEE PAGE 252.)

GIRL AT THE SPRING.—BY W. F. WOODINGTON.

THE BOY AND LIZARD. BY STEVENS.

We have referred to this pleasing little work in an article upon Sculpture, in the present sheet. We see it is now the property of Lord Colborne.

BOY AND LIZARD.—BY STEVENS.

STATUETTE—CARTON-PIERRE. BY GROPIUS.

This is one of the numerous statuettes in carton-pierre exhibited by Gropius, of Berlin. The subject is the Muse Melpomene.

GIRL AT THE SPRING. BY W. F. WOODINGTON.

This figure stands in the South Transept. Though by no means perfect, it is graceful in conception, and is fairly executed.

STATUETTE IN CARTON PIERRE.—BY GROPIUS.

FONT.—BY MARGETTS, OF OXFORD.

THE UNITED STATES.

WE enter on the task of considering the contributions of the United States more in detail than in our last notice, with very little hope of satisfying our sensitive Transatlantic friends. We shall be able to show that they have made some extremely valuable contributions to the general collection of useful produce and of useful implements; we Englishmen, as spectators, students, and eventual purchasers, are perfectly satisfied, but this will not satisfy them, for reasons which it will be much more fair and friendly to state than to blink. It is unquestionable, that, although the American public took very little pains to gather together either the greatest number or the most important articles which really are to be found in the North American Republic, the American press, according to its custom, so bewildered the parties about to exhibit with indiscriminating praise, that the greater number were filled with most unhappy notions as to the value of the Transatlantic part of the Great Exhibition.

According to popular opinion, as taught by their newspapers, the United States were to carry off the chief glories of the "World's Fair." The spread of this opinion was not extraordinary, when we consider that it was re-echoed by the journals of every city, every town, every township, every village, from Maine to the borders of Mexico, by writers who had probably never been out of the bounds of the dominions of the United States. Now, as in the United States every one reads the newspapers, and many read nothing else, it was just as natural that the people should fancy they were going "to lick old worn-out Europe," as that our country gentlemen should fancy, as they did, that we Englishmen would having nothing worth exhibiting side by side with Continental productions.

We have a perfect instance of that absurd puffing system of the American papers which has so much contributed to place Americans in a false position when they first visit Europe, in the extracts from an American newspaper circulated in a blue pamphlet, purporting to describe "the Gazelle," an American carriage.

This carriage stands in the northern compartment of the American division: we have already referred to it as constructed entirely of American wood, polished, unpainted, and varnished. It deserves praise for lightness and the perfection of the workmanship, especially in the wheels and woodwork. But it is extremely ugly, top-heavy, and wanting in those graceful curves which are essential to elegance in a morning carriage. A square box-shape may be convenient or strong, but it cannot be handsome. Then, again, the seats are too low and the body too shallow for the comfort of the passengers; while the arrangement of the fore-wheels, which do not lock under, not only renders mounting and dismounting difficult, but turning a corner positively dangerous. For all these reasons, although the Gazelle shows pluinly that the workmen who made it could manufacture a capital carriage from a handsome design, yet, as it stands, it is neither convenient, safe, nor handsome for town use by ladies, nor sufficiently strong and handy for a sporting carriage in the country, yet the proprietor expected to receive the "distinguished consideration" of the Exhibition visitors, after being told by the *Philadelphian Evening Bulletin* that it is a "splendid vehicle"—"a most exquisite piece of work"—"if they do not astonish the eyes of all the world at the Great Exhibition we shall be surprised." * * * "If Queen Victoria does not fall in love with this beautiful specimen of American skill, we shall be astonished. It would be just the thing for a *tête-à-tête* drive for her and Prince Albert in Windsor Park; and we shall expect to hear that she orders from Mr. Watson a carriage large enough to hold the rest of the Royal family." The *Pennsylvanian Enquirer* informs its readers that "Mr. Watson has completed a splendid vehicle for the World's Fair, in London, where we are sure it will be regarded as a triumphant specimen of Philadelphian taste and skill." The *North American Gazette* is not less florid in its praise.

Of course, when Mr. Watson finds few admirers and no purchasers for his carriage, after his expectations have been so much raised by Philadelphian criticism, he feels himself not only disappointed, but aggrieved; and his case is that of scores of American exhibitors, from patchwork quilts to pianos, who all came over armed with slips of favourable notices cut out from the pages of their local press.

To add to the severity of the disappointment, severe criticism was invited on the part of the English press by the unreasonable claim for space, which remains barely filled to this hour; and by "bumptious" boastings, which we never fail to cut down, whether of foreign or of British growth.

The result has been, that, while we were altogether very much astonished at the successful display of the British department, the Americans were deeply mortified and somewhat angry at the insignificant performance of their own magnificent promises.

On board an American steamer, in which a friend of ours made his passage from New York, in March last, every assemblage in the day, at dinner, breakfast, luncheon, and supper, brought out bold offers from the *Statesmen* of bets of many dollars, that their country would carry off the greatest number of prizes from all the competitors of the World's Fair. And we believe that, until the opening of the Exhibition, the same confidence prevailed in all American assemblages. Can they wonder that we laugh a little, or can they doubt that this laughing will do them good?

This small, imperfect representation of an industry which includes, amongst other occupations, the cultivation of the greatest staple of our commerce—cotton (of which, out of 770,469,000 lb. imported in 1849, more than 75 per cent. came from the United States)—which includes the construction of the finest river steamers, and some of the finest merchant ships in the world—the industry which has successfully called into operation all the arts and sciences needful for conquering and cultivating the greatest territory ever peopled by one race—contains at most two or three articles of paramount importance. The triumphs of American industry may be much better traced in a modern map and a bundle of their almanacks for twenty years, than in the miscellaneous museum which is distributed over the western end of the Crystal Palace. But, if we have laughed a little at their large promises and small performance, they cannot deny that we have given fair play and warm welcome o everything of merit.

For instance, to begin with Agricultural Implements. M'Cormack's reaping machine, which was described and illustrated by an Engraving in the ILLUSTRATED LONDON NEWS of the 12th ult., had a fair trial, or rather a difficult trial, at the annual gathering at Mechi's farm on the 29th ult. It rained in torrents, and mud and wet straw soon clogged the other instruments; but we have the authority, among others, of Mr. Fisher Hobbes, the well-known agriculturist, and one of the Council of the Royal Agricultural Society, who was present, for stating that M'Cormack's machine performed its work perfectly, and proved itself one of the most valuable agricultural inventions of the age.

Before setting this machine in motion, a path must be cut with reaping-hooks, or a cradle-scythe, outside the grain or grass, wide enough for the horses to travel in the first round. Four horses, two and two abreast, may be used; but it is better to employ a pair a time, with a relay of another pair ready. In dry weather, the machine can cut wheat as fast as the binders can gather and bind. This invention has arrived at the fortunate period, when the steady emigration of Irish labourers threatens to leave our farmers short of hands at every harvest. Even now the farmer is obliged, unless he lives on the highway where reapers are constantly passing, to reap all at once, whether his crops are fit for harvesting or not; so that some grain is left too long, and a large per-centage is lost from over-ripeness, and some is gathered too green. But with one of these machines the farmer can cut his corn exactly at the time that each field or each part of a field is ripe. In fact, it is not too much to say that M'Cormack's machine has soived a national difficulty. The proprietor will be ready to bear witness that he found no impediments from British jealousy, and that his success was hailed with as much enthusiasm as the damp weather would allow. It will be observed that an American plough, No. 40, has gained a prize. The others exhibited are good strong articles for bush and backwoods work, easily lifted away from impediments of stumps, roots, or stones, but not capable of doing work with the finish of the Scotch plough. This is perfectly well known in Canada. In the Canadian department, an iron plough, made after the Scotch model, is exhibited, which was tried last year against American ploughs, at Albany, and beat them all.

Mr. Coleman, who was sent over specially, a few years ago, by the agricultural societies of the United States, to make a tour through England and Scotland, in his printed report, pronounces the ploughing here far superior to anything he ever saw in the "States."

The fact is, that these American ploughs are exactly suited for the rough and ready work they have to do in half-cleared land. To compare them with the finished articles of Garrett, Hornby, or Ransome, is to compare two tools meant to execute totally different styles of work. In the same way, the backwoodsman uses an axe and an adze to do work that, in towns, must be finished with the plane and polished with sand-paper.

The American hay-forks deserve notice for their lightness and finish; and the same may be said of the garden tools, of all which the woodwork is very neat.

There is a garden plough, fitted with several shares of different dimensions—one wheel in front, and intended to be pushed before the gardener, like a Chilian or Maltese plough—that may be useful, especially for cutting up turf or commencing a trench. This implement has only recently been exhibited.

There are some winnowing machines, in which merit will be found, as may be expected from the ingenuity of a corn-exporting country; and among a recent lot of importations we would draw attention to a thrashing-machine, moved by horse power, on the treadmill principle, and a smaller machine intended to be worked by a dog.

Newell's lock, under the charge of Mr. Hobbs, which has already been fully described and delineated, may take the second rank in value of the American contributions as a matter of commerce. For one person who will need one of these unpickable locks at £50, there will be a hundred who will be glad to purchase one of the reaping machines at £25. Nevertheless, the lock is a first-rate article.

Howland's bell telegraph, in the Main Avenue South, a new adaptation of an old idea for superseding the number of bells for the rooms of a large establishment, by a tablet inscribed with the name of the servant, as "boots," "chambermaid," "waiter," or room, as "bar," "coffee-room," "dolphin," as the case may be, has been, we find, lately applied to the large hotel built by the Great Northern Railway Company at Lincoln, and to the Wellington Hotel in Liverpool. If it succeeds at those large establishments, it will soon make its way to our hotels and country mansions. On large steam-boats, as a means of communication between the steersman or "look out" and the engineer, the use of the bell telegraph is obvious.

Near the bell telegraph is a case of Mr. Frank Palmer's artificial legs—a very clever piece of mechanism, which imitates as nearly as possible the elasticity of the joints of the toes, ankle, and knee of a living limb. Mr. Palmer attends occasionally to exhibit and describe his invention, and then one of the legs may be seen in use, for it was the loss of a limb which directed the attention of the inventor to the imperfection of existing substitutes; for our own part, we must confess, that, after watching Mr. Palmer walking across the avenue several times very narrowly, we were unable to distinguish between the real and artificial limb, although the wearer is a remarkably tall, stout man, and has suffered amputation above the knee.

Furniture.—A bedstead is exhibited by Betjeremann, of St. John-street, Clerkenwell, not for beauty of form, but for a patent mode of junction between the joists and the posts, which dispenses with all iron-work or screws, and renders the taking down or putting up of a bedstead a matter of a few minutes, without the aid of a carpenter. The principle is, to speak popularly, a compound of dovetailing and the key-stone of an arch, and may be applied to many uses beside bedsteads. This invention bears the grandiloquent name of the Excelsior Bedstead, out of compliment, we presume, to the American poet—*drôle de compliment.*

In chairs, the best is an arm-chair, in which, by the motion of the body, without the aid of any complicated machinery, the seat and back can be made to assume and retain a number of forms, from that of a flat couch intermediately to that of a straight back. The same effect has often been attained by arrangements which were costly and liable to get out of order. This, if not new in idea, is efficient and cheap (£5). With the rocking-chairs, which were transplanted from Lancashire to the New England States, and are now re-imported as a curiosity, we are familiar; but the fashion having died out in Lancashire half a century ago, does not find much favour in England except in nurseries. There are a set of chairs arranged on four C springs, which are new to us, and would seem to be rather pleasant for study or library use, because they give way to the motion of the body in writing, and afford a sort of lounging chair without reclining. They are rather dear.

The revolving table, intended for a railroad clerk's tickets, was scarcely sufficiently remarkable to be worth sending. The principle is as old as convent turn-boxes, but it suggests to us that at the refreshment-rooms in the Building, and at railroad stations, an economy of time, with convenience to the public, might be effected in distributing tea and coffee, by using a series of circular dumb waiters, fitted to receive the saucers. This would save all stretching across the counter, and a dozen could be served as easily as two on the present plan, for, in the face of a crowd, the waiter would only have to keep filling and turning the circular tray.

Portable beds are exhibited by every nation. The notable feature of the American portable bed is that it folds up by its own gravity, on being lifted up at one end, into a space of 8 inches by 18 inches. It may be, but scarcely seems, strong enough to bear the restless tumbling of a heavy man.

The most interesting American furniture is included in the display of New England, in the Intermediate South Avenue. Here we have a set of the desks and chairs used in the New England common schools. The chairs are a great improvement on the system of benches; each child has his own, with a small wooden side pocket for books on the right hand; in some, space is economised by a single iron leg or pillar, which is screwed to the floor. The smaller chairs, for infants, have four legs, with iron cramps for the same purpose. We commend these school fittings, from their simplicity and cheapness, to the notice of many in this country interested in village education.

The universal education afforded in the common schools of the United States is a sort of useful industry which cannot be exhibited in competition for a medal, and yet it is a system which we might imitate in many respects with much advantage.

Talking of schools, reminds us that, among the applications made for space previous to the opening of the Exhibition, was one from a Scotch schoolmaster, who required room for himself and forty of his pupils, "*in order to demonstrate, viva voce, day by day, the superiority of his system of instruction.*"

Near the American chairs are several specimens of very neat and cheap wood-work, such as bench-screws, axe-hafts, and washing-boards, and buckets of cedar, bird's-eye maple, and other ornamental woods. There is a capital American rolling-pin, on a new principle; the rolling part turns on an axis between a pair of handles. In the adjoining department are barrels full of shoemakers' pegs; and a collection of specimens of the various timber and other trees of the United States, with printed descriptions of their respective qualities.

In describing these woodworks, we have rather travelled out of the line of furniture; but we must not pass over two kinds of stuffing for bedding: first, a sort of moss in texture and colour, resembling horse-hair, for which it is proposed as a substitute, the price being less by one-fourth. A large quantity of the article is exhibited, and a mattress stuffed with it, which visitors are permitted to punch or otherwise experiment upon; and, secondly, the husks of maize or Indian-corn, prepared for making palliasses. This looks clean and softer than straw.

Articles of Food.—In this department the United States come out very strong in quantity. The quality remains, as far as the Exhibition is concerned, a mystery—the arrangements with Monsieur Soyer, for giving a feast of the food of all nations, not having been completed.

The prime family beef in casks, half covered with fat, and quite covered with a heading of glass, looks very well; so do the glass jars of peaches, preserved in brandy, intended for her Majesty. Nothing can be more orthodox than the external covering of a long row of hams; but in such cases it is impossible to decide whether the curing has produced the Westphalian, or Cork, or York flavour.

Up to the present time, American bacon has not been worth eating; but, as they have the pig in plenty, it may be expected that some of the Yorkshire and Irish emigrants will introduce the true system of preparing flitches.

What can we say about cobs of Indian corn of all colours, from pale yellow to deep red? or what can it be necessary to say about casks of flour, when casks of the same kind fill hundreds of ships bound for England every autumn and spring?

The meat biscuit exhibited in a glass case, in the south compartment, but which the American Commission will allow any person, having a right to make the request, to taste, is one of the articles of provisions which we can venture to review from actual trial; having cooked and eaten one of the biscuits, we can pronounce it eatable, although very far from coming up to the panegyrics of the pamphlet testimonials in which its merits are set forth. Armies in campaign and colonists in new countries must be glad of a meal of any kind, without being as nice as when they have an Astor House or London Tavern within a mile. The meat biscuit, in soups, has a greasy, nutritive taste, something like soup made with polenta and butter; it is compact, and easily cooked. As the Americans are the greatest overland travellers, and are likely to make the longest military marches, a very few years will settle the merits of the meat biscuit.

We have before referred to the process by which Messrs. Stafford get rid of the unpleasant and even deleterious moisture of Indian corn, so as to preserve the flour sweet for any length of time. So long as wheat maintains its present price, and Ireland escapes a second famine, there will be little demand for Indian corn in this country, except as a luxury, and to feed live stock; but those curious in such matters can obtain bread made with a mixture of Stafford flour, at the refreshment-rooms, in the Building, and at Oram's, baker, Charing-cross. We can vouch for its being extremely nice, a great improvement on ordinary baker's bread, a mixture of Indian-corn flour being much sweeter than alum.

Chewing tobacco must, we presume, be included among eatables. Several boxes of Cavendish are shown, one of which bears the following note-worthy inscription:—"To be presented, after the World's Fair, to Lord Wellington, by Wiley J. Stratton, Glasgow, Haward county Missouri." No doubt, if the Duke chews, this will turn out a delicious article. The articles demanding no detailed explanatory notice are truly miscellaneous, including, as they do, specimens of slate-paint, vouched to possess extraordinary qualities; of lard-oil, equal to sperm; of "sweeps" and fine-finished oars, intended for the Prince of Wales; and some, as penholders, for the Lords of the Admiralty. White sand, of fine quality, which would be valuable here, if the freight did not render importation, unless in bulk as ballast, unprofitable; zinc, in ore and manufactured; yellow marble, and soap-stone baths; and girdles for baking cakes, which would sell here *at a price;* an air-exhausted coffin, which will render embalming unnecessary; a canoe, from South Carolina, cut out of a solid trunk, which would make a pleasing curiosity on the Serpentine; and a picture of a railroad-bridge over the Susquehannah, in Pennsylvania, with a written description, stating that it cost £6000 a mile, and has been made *without debt!* The note of admiration is not ours. The last articles introduced into the Building in this month include several cheap ploughs and cultivators; a new drilling machine, to be worked by hand or a pony; several sets of tools, and carriages.

The above will, we believe, give a very fair idea of the American part of the Exhibition. The importance of the greater number of articles—such as the glass, the carriages, and the machinery—depends on the price at which they can be delivered; and, to supply this *hiatus*, the exhibitors should unite to get out a priced catalogue, like that of the Saxon department.

We may take this opportunity of saying that every country and every manufacturing district which wishes its part in the Exhibition to be profitably remembered, should endeavour, before the close of the Exhibition, to publish a catalogue of its own contributions, with prices attached. This is not only needed as regards Belgium, France, and the United States, but Birmingham, Sheffield, and all places where they manufacture complete articles, would find it their interest to do the same.

INDIAN PRESENTS FROM HIS HIGHNESS THE NEWAB NAZIM, OF BENGAL, TO HER MAJESTY

BEFORE entering on a description of these magnificent presents separately, we may mention, that, about fifteen years ago, the father of the present Newab forwarded to his late Majesty, William IV., articles of a somewhat similar nature, and equally handsome with those of which we are about to speak. These were duly acknowledged, in a letter bearing his Majesty's signature, by the return of his Majesty's own portrait, and by conferring the Guelphic Order on his Highness—the last individual, we understand, on whom that order was conferred.

On the present occasion, it is exceedingly gratifying to know that the idea of forwarding these presents to her Majesty *emanated entirely* from his Highness the Newab Nazim himself, and that although, as in all such cases, the act required the sanction of the resident or political agent of the Governor-General, they would never have been sent, had not this spontaneous and loyal feeling originated with the young Prince himself.

From circumstances which it is needless here to mention, his Highness the Newab Nazim had not been in any way a contributor to the Great Exhibition of Arts and Industry; and as, at the time these presents were sent off, the period had expired which allowed of any articles being transmitted to the World's Bazaar, the precedent in his father's case struck the Newab, and he acted upon it, in proposing to Mr. Henry Torrens, the Governor-General's agent at Moorshedabad, that he might be permitted to forward these presents to her Majesty direct, and suggesting that, at her pleasure, they might be afterwards sent for inspection to the Crystal Palace. To this there could not, of course, be any objection; and, within ten or twelve days after this proposal had been agreed to, the articles which we now see on the south side of the Indian department were packed and shipped on board the steamer *Haddington*, bound from Calcutta to Suez—a hazardous experiment, we should have said, to send overland such bulky packages, encased as they were in strong deal boxes.

These presents were entrusted to the charge of his Highness' physician, Dr. Young; and with what success the mission has been carried out, the public have ere this been able to judge. Too much praise cannot be bestowed on the pains taken by all parties in the transit of these goods; and, when we inform our readers that two of the largest of the packages were slung between camels across the desert, which duly reached their destination at Boulac in time to be transmitted by the usual mail, they will judge for themselves how active must have been the agents of the transit companies, of which there are two, acting in concert; and thus enabling Dr. Young to accompany, without delay, the valuables of which he was in charge. After a safe and prosperous voyage, they were landed at Southampton, from the steamer *Ripon*, on the 26th of June last; and early in the following month they were, at her Majesty's express command, forwarded direct to Buckingham Palace, where Dr. Young, after having been presented to her Majesty and Prince Albert by Lord Broughton, was requested to give an explanation of the contents of the packages entrusted to his care.

They consist of a howdah, with all the trappings complete, belonging to an elephant—the howdah having two seats, the front of large, the back of smaller dimensions; the sides made entirely of ivory, inlaid, and painted in gold, and covered with a canopy gorgeously worked in gold and silver brocade, an awning in front supported by two ivory poles, and acting as a protection from the sun. The position of this awning designates the standing of his Highness, and is only to be seen in the establishment of the Nizamut. The "jhool," or covering on which the howdah rests, is of splendid workmanship, the body being of velvet, with a richly-embroidered gold border, having corners of raised gold needle-work, well worth the attention of workers in this art in our own country.

For the sake of the display of these things, it is unfortunate that a larger elephant was not obtainable; but, as we have noticed in a previous Number, the public are, at any rate, enabled to form an idea of the mode in which the howdah is fixed, as also of the facility with which the whole apparatus is borne on the back of these useful animals.

The throne, or native reception-seat, with its splendidly-worked "shamiana," or canopy, we next proceed to describe:—This consists of a piece of velvet of about eleven feet square, with a rich gold and silver border two feet in depth, leaving the centre to be occupied by the person reclining; of a separate piece of velvet of about six feet square; of one long pillow worked in velvet and gold, supported by a framework of silver bars, to prevent its receding, other smaller pillows being used in the East for the comfort of the occupant.

The two "moorchals," or emblems of dignity and rank, are only allowed to be used by a few of the princes in India, in the presence of the Governor-General. They are of great value, the handles being of the purest gold; these are held by mutes, who stand on the right and left behind his Highness when reclining. The canopy, which is also about 11 feet square, and most elaborately worked, is supported by four silver pillars, about 7 feet high: a circular centre worked in gold and silver spangles has a beautiful effect; and a border of nearly three feet in depth leaves very little of the groundwork of the velvet visible. The *tout ensemble* of this seat and canopy has attracted particular attention.

The state palanquin is similar to the howdah, with a long pole attached to each side, and carried by eight pole-bearers. One slight difference exists, which is, that this conveyance consists only of one seat, used as is the howdah, on state occasions alone, or when his Highness the Nawab holds his "durbar," or levee. The projecting awning resembles exactly that of the howdah in workmanship, &c.

The "palkee," or conveyance used when the sun is low in the horizon, is of rather smaller dimensions than the palanquin, having no canopy or dome above it. It is carried on the shoulders of servants, and an exceedingly easy motion is given to it when these bearers are in the habit of working or running together. The velvet and silk materials with which these conveyances are lined are all of Indian manufacture; and we cannot but admire the taste and elegance displayed not only in the mixture of colours, but also in the beautiful patterns embroidered on all the gold and silver parts of the work.

WAX-WORK.

THE great glass beehive contains a certain portion of wax. To this, in its artistic forms, as representing the productions of nature, we propose to invite attention.

The wax flowers in the Exhibition occupy a prominent and extended space. Their series of red labels strikes the eye almost immediately upon entering. They are in the North Gallery, over "Persia" and "Greece." A more graceful cluster of contributions to the great collection will not easily be found. Let us ascend the staircase, and examine the *hortus siccus* laid out by a series of ingenious gardeners, chiefly ladies. It is a little winter garden, arranged in anticipation of the intended Paxtonia. And should the idea of the great garden be carried out, and the colossal notions of the gentlemen who publish indignant and stimulating epistles be realised—if a cascade "rivalling Niagara" is to pour from the roof of the North Transpept to the ground, "the large trees being rendered accessories to the magnificence of the prospect," and a hundred fountains in various parts of the Building are to be fed from the monster torrent, we think that in many of the thousand nooks and corners which will be created by the development of these bold conceptions, there will be an excellent and fitting place for a permanent display of the talent of our wax florists. If the projected garden be intended as something more than a beautiful sight, and if the science of botany is to be—as it easily might be—illustrated, progressively, in a way which has never been attempted before, the imitative art will necessarily be called in to complete many a chain of specimens. It will occur to our readers that there are vast numbers of trees and plants which it would be impossible to exhibit in a public building, having due regard to the comfort of those who are to frequent it. The magnificent palm-house at Kew is an admirable specimen of contrivance, and contains a noble collection; but for how many consecutive minutes is it possible for a person in ordinary health to endure the tropical atmosphere? The sudden plunge into a climate supposed to reproduce that wherein

> The feathery palm trees rise,
> And the date grows ripe under Eastern skies,

is in itself a reason for the comparative neglect for which the public are, we think, unfairly, complained of as regards Kew. But, though the actual cultivation of many exotics would be incompatible with the proposed purpose of the Crystal Palace, there is no reason why such plants should not be artificially represented. A most beautiful and interesting addition to the attractions and to the scientific advantages of the place might be made, if those who are to have its arrangement would call a council of botanists, and empower them to instruct Mrs. Peachey, Mrs. Dorval, the Messrs. Mintorn, and the other leading artists in wax, to exert their skill for the due illustration of those botanic families whose real representatives it will be impossible to introduce into the Building. We commend this suggestion to the consideration of the authorities, and, as precedent is everything in these days, we refer them to the mineralogical department of the British Museum, where, that the diamond family may be adequately shewn, we find real diamonds up to a certain size, and then paste copies of diamonds which it is impossible to obtain.

The art of modelling wax flowers is a very charming one; but a certain disfavour has attached to its practice by amateurs, on account of the deleterious ingredients which the cupidity of trade has, for the sake of cheapness in production, frequently introduced into the material. But this is merely one of the "accidents of commerce," as frauds are now politely termed, and its results may be avoided by purchasing only of first-class tradesmen. We are informed, upon the best authority, that there is no necessity for the mixing one single grain of injurious matter into the material for modelling the most variegated bouquet that ever glowed. And, this objection set aside, we hardly know a more elegant accomplishment for a lady than the knowledge of this art. She must keep perpetually before her the most exquisite and fragrant production of nature; she must study it with the same closeness of observation she gives when making water-colour drawings; and she reproduces her flower with a cleanly and pliable material—the very type of plasticity. And as her great-grandmother adorned her walls with garlands in tapestry, our fair artist every day adds a new ornament to her apartments; she has, in plebeian parlance, something to show for her money and trouble. And, as for the money, the economical character of the necessary preparations will not in these times be among the least recommendations in the eyes of papas and husbands. We are apprised that all the articles a lady requires to enable her to make wax flowers are a pair of scissors not too tight in the screw, a small and a large china-headed pin, one ivory pin, tinting brushes, some prepared carmine, smalt, cobalt, two shades of chrome, and white, all in powder, a little wire, and some sheet wax. This is not a very formidable array of machinery; and, this obtained, the art may be acquired by the study of any of the excellent little hand-books upon the subject, or, more easily, by a few lessons from one of the regular artists. We should, of course, prefer to see a lady in the open air, with her flapped hat and gardening gloves, tending real flowers; but, for an in-door amusement, there can hardly be a prettier one than what, if *Lady Macbeth* had been in the habit of practising it, her husband would have called the throwing one's talents

> Into the *cire* and yellow leaf.

The wax-florists at the Exhibition are chiefly English, the foreign contributions in this department being unimportant. One of the more effective instances of grouping is on the stand appropriated to Mrs. Strickland, who displays a very handsome opal vase of graceful shell-like form, containing a very charming collection of flowers. But a more interesting sight is upon another portion of the same lady's stand, and where the eye does not so readily detect it. This is a model of that extraordinary production of America, the *Victoria regia*, respecting which so much interest has been excited. Both sides of the gigantic leaf, with its extraordinary and almost innumerable ramifications of fibre, are shown, and the flower is seen in its various stages of development. Other artists have the flower in their collections, and it is excellently re-produced; but Mrs. Strickland's is, we think, the most complete illustration of this very remarkable plant. Mrs. Temple has an exceedingly handsome case of flowers, the colours of many of which are exquisitely displayed. Mrs. Dowell's collection also deserves the highest praise, it appearing to us that this lady is peculiarly successful with the more delicate flowers, and very fortunate in the selection of her tints; there is also much artistic taste in her arrangement. In selecting a few names for mention, it must not be supposed that any censure is implied in the omission of their names, for we cannot call to mind a single instance of carelessness or unfaithfulness (so far as we have had opportunity of studying the British and foreign originals), and there is not a case in the cluster which will not reward examination. The crowd of fashionable visitants who seem instinctively to find their way to this corner of the Exhibition, testifies to the successes of the various artists. But we must specially refer to a large case, exhibited by the Mintorn family (well known for their skill in these productions, and for some useful publications on the subject), who show a variety of the more rare and curious plants, in various stages of their existence. We do not know whether there may not be a want of what critics call dramatic keeping in this group. We are scarcely learned enough to say whether the unity of time is preserved; in other words, whether specimens in such different phases can be seen in nature at the same time. If so, and Messrs. Mintorn doubtlessly know best, the collection is as perfect in idea as in execution. A more thoroughly interesting, or more choicely assorted display of natural beauty and quaintness, we have never seen; it has a higher value than that of simply imitative art. We must also mention some wax fruit, by Mr. J. Down, with strong reprobation, not because it is not exceedingly good—much of it indeed beautiful—but because its situation is such as to induce the greatest possible amount of unhappiness to the greatest possible number of the rising generation. Upon occasion of several visits which we have paid to this part of the Exhibition, we have noticed episodes arising from Mr. Down's fruit, which is maliciously placed "on a table of original design," so low as to be on a level with the juvenile lip. We have seen wearied mothers, tugging at still more wearied brats, suddenly pulled up short at this display of fruit, and compelled to give battle to their sulky progeny, which, listlessly passing other attractions, clings to Mr. Down's table, and refuses to be comforted. And, one day last month, we saw a small and greedy-eyed boy, who had slipped from the maternal gripe, and slunk back to the wax pears and apricots, busily but stealthily trying to insert a knife at the junction of the glass. We watched him, with a faint hope that he would succeed, but his incensed proprietor came up, and with a hasty swoop, and some extemporised comminations, bore him away. Mr. Down is responsible for that lad's disgust at our social institutions. And before passing from the wax flower group, we may add an expression of our regret, that differences of some kind prevented its including the very magnificent case and bouquet which had been prepared by Mrs. Peachey, one of the artists in wax to her Majesty. The stand itself, which, with its contents, was on private view, is, externally, more elegant than any of the cases in the exhibition, and the flowers would have yielded to none in variety or brilliancy of tint. The reputation of Mrs. Peachey, whose artistic talent is of a first-rate description, would have justified the authorities in some concession, and would have enriched this department of the Exhibition with a feature of no ordinary beauty.

We ought not to leave the Gallery without glancing at a large glass-case, before which there is always such a crowd of mammas and little girls, that a male critic seems an intruder. The contents of this case hardly come under the two heads into which which we propose to divide our examination of the wax-work in the Exhibition, inasmuch as they are not precisely either representations of the productions of nature, or of a group of the human family. They are, however, something between the two. The case consists of dolls, *en cire, nues et habillés*. They are by Madame Montanari, a name of which we shall have occasion to speak by and by. Certainly, it is impossible to conceive a more charming fairy court than is held in this minor glass palace. There are dolls in every stage of doll life—baby dolls, lady and gentleman dolls, and dolls of no particular age, but combining the artless smile of early dollhood with the finished toilet of a milliner's model. The hair is inserted into the head, instead of being gummed on in a scalp, and the eyelashes and eyebrows are similarly arranged. The costumes of the figures are superb, finished *à quatre épingles*, and the tiny ornaments, bracelets, ear-rings, watches, chains, and rings, are put on with microscopic precision. There is a *partie carré*, consisting of young ladies representing the four quarters of the world, their skins being fair or dark, according to their place of nativity; and their dresses, though in the cases of Africa and America a little idealised, are very appropriate. The magnificent *toilettes* of some of the larger ladies elicit the most charming little screams of rapture from the fair inspectors; and the baby-models, with their fat naked legs and taper fingers, extort very loving glances from young mothers. There is a quaint little nudity who stands up in front, like *Puck* among the fairies, and very grotesque by contrast with the luxurious wardrobes around. Altogether, Madame Montanari may be congratulated upon having set an artistic example which will be duly appreciated by those happy parents who can afford to indulge the iconolatry of their offspring with objects the expense of which, we suppose, bears a due proportion to their elegance. In an adjoining frame, however, are idols framed upon a more economical principle; they are called by the Ashleyan name of rag-dolls, but the title does not suggest the smart-looking articles in question, which, though of course lacking the high-bred complexion and style of the wax ladies, are rosy and smiling enough. This sort of doll, which is by no means dear, is, we are informed, largely patronised by her Majesty for the benefit of the Royal nursery. Its merit is that it is perfectly soft, and therefore cannot injure a child, and is so yielding that a child cannot, in turn, injure it. Strictly, we have no right to include the rag-doll in our examination, but it may perhaps be allowed to come in with its waxen brothers and sisters, by whose side it dwells, rejoicing in the approval of Royalty.

In the Fine Art Court, down stairs, we find a few additions to the collection of wax-work modelling, as *tableaux* of flowers, copies of plants, a portrait group, several medallic portraits, and some animals. But the great wax feature of the Exhibition, and, in an artistic point of view, by far the most important work in this department, is a large group of figures which we find pyramidically arranged on a large table in this part of the Building. A spectator cannot fail to observe it, from a rickety canopy incessantly shaking over it, and from the number of visitors crowding round it. It certainly deserves all attention, for it is not only a collection of exquisitely finished works, but it conveys a vivid idea of a remarkable people. The artist, Mr. Montanari (though his name be foreign, he comes into the English department by virtue of his residence in London), has endeavoured, most successfully, to illustrate "Mexican town and savage life." This he has done in a series of figures, chiefly single, but several in groups. They represent an immense variety of incidents in the life of the wild and tame Mexican. Among the most conspicuous subjects in the history of the civilised man is the bull fight, of which separate episodes are shown. In one of them the outraged and infuriate animal, smarting under the torture of the *banderillos* which are fixed in his back, is making his terrible rush.

> His eye is fixed! Away,
> Away, thou heedless boy; prepare the spear—
> Now is thy time to perish or display
> The skill that yet may check that mad career."

In another group the bull's last moments are approaching—the Mexican rival of the "great Montes" is meditating the death stroke:

> And now the matadors around him play,
> Shake the red cloak, and poise the ready brand;
> Once more through all he darts his thundering way.
> Vain rage! the mantle quits the coynge hand—
> Wraps his fierce eye—'tis o'er—he sinks upon the strand.

Another, and a very well-imagined group, illustrates the period when the game is over, and the body of the slaughtered bull is being hurried away from the arena, that a living animal may take his place.

> And steeds that spurn the rein, as swift as shy,
> Hurl the dark bulk along, scarce seen in dashing by.

But these groups, excellent as they are, the fiery character of the scene being well preserved, and the dresses of the *tauridor* and the trappings of the horses being very elaborately finished, are by no means the most interesting features of the collection. These, we think, will be found in the Indian and slave figures. The Indians are particularly characteristic of the fierce and predatory habits of the people we hear fresh news of by every batch of American journals; but the mixed squalor and picturesqueness of the race will be best understood by these models. There is a kind of second Mexican Rolla, holding a white child high in air; only the sentiment of the situation is reversed, as the Indian is stealing the infant ("robbing" him, the label states, but the dagger and attitude speak of felony rather than larceny). And there is a scalping scene of great horror; the long black lock of the victim being firmly grasped by his victor, who has thrown him on his knees, and brandishes the glittering knife with a fierce cry of triumph. A figure of an exceedingly aged female Indian is executed in admirable style, every fibre in her lean frame apparently developed, and her whole aspect that of misery. The more pleasing aspect of Indian life is shown in the charming figures of some of the younger squaws, who are models of female beauty so far as form goes. Their bodies unfettered by drapery, a gay feather garment from the waist to the knee being about the extent of their wardrobe, their admirable proportions are brought into favourable view. The rich dark complexion glows with health, and the limbs are full of strength and vigour. Presuming these ladies to be types of their class, and not exceptional beauties, the Indian may be forgiven the pertinacity with which he fights *pro aris et focis*. Some figures of slaves, engaged in various menial offices, show a different phase of life; and these, who have, apparently, the squalor of the Indian, without his fierce bearing, look pitiable enough—they seem to drag the limb, rather than use it, and their countenances wear a very degraded expression. Contrasted with them is the elaborate and glistening *toilette* of a Mexican belle, who appears with a display of gold and jewels, something like that the unlucky aborigines of her country must have made in the days of Cortes. She is a most captivating spectacle, and, in point of show, throws the most brilliant costumes of the Old World completely into the shade. Observe her step and manner—some indolence, some coquetry, and a great deal of fire ready at a very short notice. She is not a person one would like to offend, and yet, no doubt, she is very fascinating to her dark-eyed suitors. Further on, Mr. Montanari has thought proper to typify Mexico herself, by an allegorical figure of a gaily clad young lady, with naked feet, who is mounted upon a hillock of gold coins, and grasps her banner, "looking fearlessly into futurity." In another place, and, we presume, in order to show that his faculty of representing a class is not limited, we find a white Venus, very carefully and delicately modelled by the same accomplished artist; the rosy-tinted flesh of Europe contrasting well with the glowing duskiness of the American figures. We have touched upon but a few out of this large collection, in which will be found gallant smugglers, bold bandits, grim miners, grimy charcoal-burners, smart *soubrettes*, and almost every variety of social and unsocial life. The artist is very fortunate in his treatment of most of his figures: the wax serves him excellently; but what will probably strike the mass of spectators as the characteristic of these models is the extraordinary minuteness and beauty of finish, chiefly as regards costume and ornament. Not only has the coquette her bracelet, but every jewel in her bracelet is shown—ear-rings, finger-rings, watches, all are in the same state of miraculous completeness. What would, of course, be unworthy, if not impossible in the case of a work of pure art, is here most laudable. The artist's object was imitation, not idealisation, and he has carried out his intention with extraordinary care and success. For a series of literal transcripts, executed *à merveille*, we have not often seen anything equal to Mr. Montanari's Mexican figures.

As we have said, England has nearly monopolised the wax-work of the Exhibition. If, guided by the Catalogue, we wander through the foreign department, we here and there light upon a solitary case of flowers or fruit, but we do not discover much requiring mention, except in the Portuguese department, where, in no very favourable place for view, we find some "Waxen work, by H. Ferraz and sisters," which consists of some small cases of modelled fruit, apparently executed with care, but not arranged in a way which does much justice to the fair artists.

It seems fair, at the end of such a notice, to remind such of our readers as do not take much trouble to find out things for themselves, that the "undoubted original inventors and artists in wax" are the only permanent occupiers of any part of the Crystal Palace. They are permitted to sleep there at night, and to carry on their avocations during the day, with constant liberty of ingress, egress, and regress, upon the arrangement that they do not intrude into any other part of the Building than the commodious apartments appropriated to their use. These are at all times open to the examination of the public, and those who would like to see the manufacture and its adaptation, have only to ascend to the Gallery, at the extreme western end of which they will find some sheets of glass so arranged as to form a kind of little conservatory within the Building, but completely isolated from it, and with entrances outside the windows. That glass is, if the author of "Orion" will allow us to borrow the phrase, the "false medium which separates bees of genius from the public."

S. B.

NEW WATCH-STAND. BY JONES.

This is a very pretty little article for the table or chimney-piece, affording security for the watch, with facilities for presenting its face in any direction desired.

NEW WATCH-STAND. BY JONES.

JEFFREY'S MARINE GLUE.

The marine glue is one of the inventions which have arisen from experiments made to attain in some measure the same object by different means. Messrs. Jeffrey, Walsh, and Co. exhibit in Class 6 a great variety of specimens of their marine glue as applied to various parts of vessels, in order to show the strength and tenacity attainable by the use of this important substance. Many years ago Mr. Jeffrey turned his attention to a process, by galvanic action, of producing copper sheathing suitable for ships' bottoms; but, after numerous experiments and considerable expense, finding the cost of production of the copper sheathing by his new process to be equal to that of the copper-plates for ordinary use for the same purpose, he abandoned his scheme. Nevertheless, his investigations on this important subject led to "the idea of employing resins insoluble in water as an effectual protection to ships' bottoms." The result was the composition which is known as marine glue, and which is now so extensively used in the navy. It consists simply of three ingredients, viz. caoutchouc, coal naptha, and shellac, in proper proportions. It requires several days to dissolve the caoutchouc previously to the addition of the shellac. The various specimens of marine glue, which are placed towards the east end of the Machinery-in-Motion department of the Great Exhibition, are well worthy of an inspection.

The specimens marked 1 and 2 are removed a little way from the north "wall," while the rest, distinguished by the letters A to L inclusive, are placed close to the same wall.

No. 1 is a piece of the mast of the *Curaçoa* frigate, after her return from South America. The glue was found to be inseparable even by the application of the wedge.

2. The next specimen is the piece of mast put together with the marine glue, and subjected to a pressure of 22 tons, by means of the hydraulic press, before the splinter could be effected. In order to show the great additional strength of the main-mast, the fore-mast, and the mizen, by the use of the marine glue, it is only necessary to observe that the number of feet of surface joined in the three masts is equal to 2128; so that only taking three tons to the foot, we have an additional strength put into these masts of not less than 6384 tons, a thing unprecedented.

The specimen distinguished by the letter A is a jib, tongued and put together with the marine glue.

The block of elm, about 12 inches square, marked B, and put together with the glue, was subjected to an explosion of gunpowder. At the conclusion of the trial, it was found that the seam or joint was perfect.

The piece of a deck (C) put together with the glue was taken from a vessel, the interior of which was destroyed by fire, and, although the underside is considerably charred, the upper side, including the glue, is perfect.

Mr. Jeffrey, at the request of Sir I. K. Brunel, prepared a cannon-ball (D), of oak, about seven inches in diameter, which was fired at Woolwich, in 1842, at an angle of forty-five degrees, to ascertain the effect of concussion on the joint when rebounding from the earth. On an inspection of this interesting specimen, it will be found that the joint is still perfect.

The next specimen, marked E, is a block of deal about twelve inches square, with a surface glued of similar extent. The wood was shattered at four tons. Thus, taking three tons per foot, we have additional strength of 25,000 tons distributed over the hull of a first-rate.

F. Short length of a model mast, of about 8 inches in diameter, exploded with gunpowder. Although the wood is rent, the splinters are confined by the marine glue.

G is a section of the same.

H and I. Short length and section respectively of a model mast, of about 6 inches diameter, made of northern seasoned timber, very durable and strong. This is composed of eight sections, put together with the marine glue.

The next specimen, marked J, shows the method of converting rectangular into circular timber, by dividing the rectangular piece by a segmental cut at the radius required, and then placing the under piece above the upper piece, and connecting the two pieces together with marine glue. The ribs of the roof of the Transept of the Palace of Industry were thus formed, not, however, having the use of marine glue at the joints.

K is attached to a mahogany deck, payed with marine glue; and, finally, four seams are shewn marked L, two of which are payed with marine glue, and two with pitch, which have been subjected to the same temperature under the line. The effect of the sun on the seams made of pitch has been to melt it away to the depth of an inch in parts, while the glue in the first case remains perfect.

THE GUARDIAN ANGEL.—BY VITTOZ.

THE GUARDIAN ANGEL. BY VITTOZ.

Amongst M. Vittoz's collection is a pretty little group, entitled "La Fortune et le jeune Enfant," which we have great pleasure in engraving.

GROUP OF SILVER. FROM RUSSIA.

(*See Engraving on Front Page.*)

The ornamental works in silver from Russia are chiefly contributed by two houses—those of Ignace Sazikoff, of Moscow, and Theodore Verkhovzoff, of St. Petersburgh. The style of all these works is of a high class of merit, the workmanship extremely finished, and the designs generally marked with good taste, being based mostly upon the examples of the best periods of European art. The group we have engraved is of works exhibited by the house of Sazikoff. The principal object is a large centre-piece, comprising a group representing Dmitri Donskoi, Grand Duke of Muscovy, after the battle of Koulikoff, in 1380, which delivered Russia from the yoke of the Tartars, under which it had been oppressed for 150 years. The artist has chosen the moment when Prince Michael Tverskoy comes to announce to the Grand Duke, who, having been wounded, is reclining under a palm tree, that the victory has been gained. The figures are extremely well designed, and the general effect highly artistic. There are other smaller fancy subjects distributed in various parts of the glass case, such as a goblet representing a Cossack woman, another with a Finish hunter, a third with a milk-woman, and a paper press ornamented with a group of a dancing bear with peasants, all characteristic and capitally executed. Besides these, are cups, some of the Byzantine style, some of the Russian, and various other subjects, which reflect great credit upon the taste of the old Russian capital.

Verkhovzoff, of St. Petersburgh,

BRONZED GATES. BY THE COALBROOK DALE COMPANY.

The handsome Park Gates of cast-iron, bronzed, produced by the Coalbrook Dale Company, and which stands across the entrance to the North Transept, are justly admired as one of the most successful efforts of iron-casting of recent times. They are after an original design by Charles Crooks, and consist of a pair of principal gates and two side gates, which are hung on iron pillars of peculiar construction. Each of the gates was cast in one piece. The style is light and elegant, and the bronzing extremely rich.

THE NYMPH OF LURLEIBERG. BY ENGELHARD.

All who have steamed up the Rhine know the precipice of Lurlei, and its famous echo, which is supposed to repeat sounds fifteen times. There is some legend attached to it, in which a nymph is concerned, though at the moment we do not recollect the particulars. M. Engelhard, of Hamburg, amongst other contributions in the plastic art, presents us with an inspiration of this fanciful creation—a composition of some merit of design, and not deficient in grace.

COLLINGE'S PORTABLE STEAM-ENGINE.

Messrs. Collinge exhibit in the "Machinery in Motion" Department a five-horse portable direct-acting high-pressure engine, in which we find great simplicity, owing to many of the reciprocating parts usually observable in engines being dispensed with. In this engine, the piston, with its vertical rod, which works in guides, acts on the crank by a connecting-rod, and the slide and feed pump receive their motion from eccentrics on the fly-wheel shaft. The reversing gear is of a novel description, enabling the engine to be worked in either direction with equal effect, so that this part of the machine may be applied with advantage to marine and also locomotive engines.

The frame-work is of neat appearance, entirely without ornament—solidity of material and economy in construction having been kept in view in forming the design.

CANDELABRUM, &c.—BY HARVEY AND GRAYHURST.

STATUETTE OF AN ANGEL.—BY GROPIUS.

has also a very handsome display, though of fewer works, including a bas-relief in silver on a gilt ground representing the descent from the cross, chased by hand; and another representing the Crucifixion, Prophets, and Evangelists, also chased by hand, in the old Byzantine style, and intended as an upper cover for the New Testament.

STATUETTE OF AN ANGEL. BY GROPIUS.

The productions in *papier maché*, paper, and stone, by Gropius, of Berlin, exhibit great variety, and considerable applicability for building decoration. The figure of an angel, which we engrave, is bronzed, and is appropriate for a niche in a church.

CANDELABRUM, &c. HARVEY AND CO.

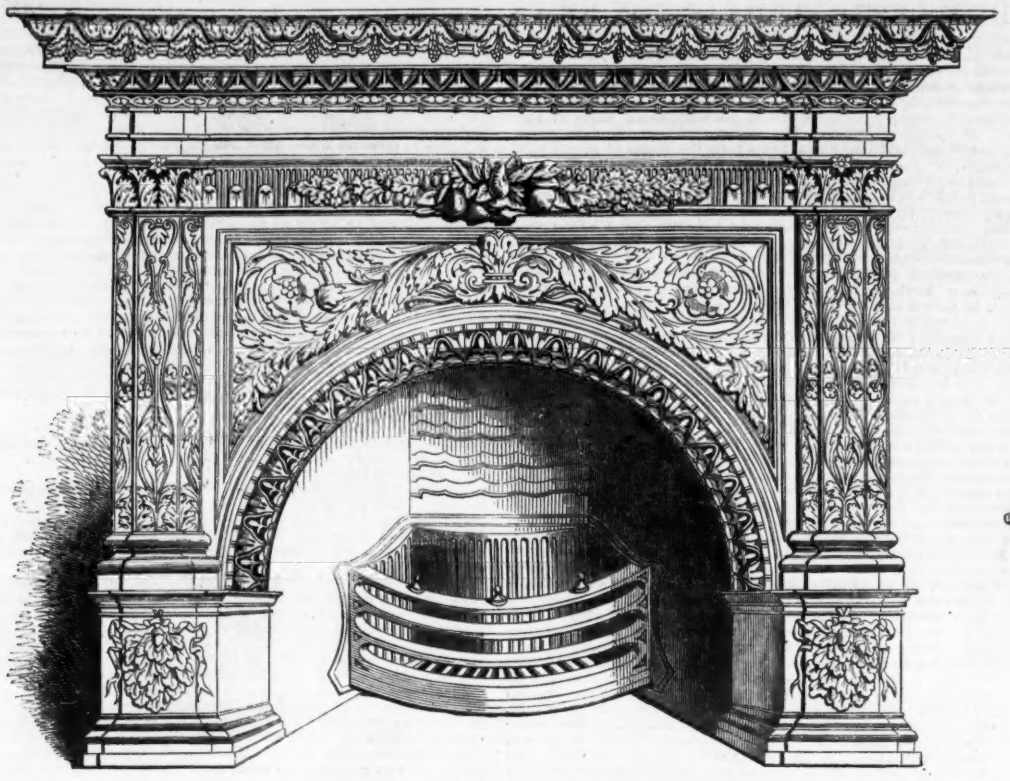
This candelabrum is extremely fanciful, and pretty in design. It is composed entirely of shell-work, mineral plants, and water. The principal figure is that of Venus, on one side of whom is a syren singing her lover; on the other hand is another of the same class of beings, entwined in a net, who is presenting the Goddess of Beauty with a string of coral. On the stem is a young triton covering her with pearls; and on the summit a Cupid shooting at every heart. The workmanship is very careful, and the whole has a pleasing effect. The silver ewer of antique fashion, and the mug, which is silver gilt, of the cinque-cento style, are both very beautifully executed.

WALL DECORATIONS IN CANNABIC. BY ALBANO.

"Cannabic" is the name of a new preparation from hemp, intended to supply the place of *papier maché* and *carton pierre*, invented and patented by M. Albano. Whilst, perhaps, it has not quite the softness of surface of the former named materials, it has the advantage of great durability and of quickly drying. It was first used by M. Albano in the decoration of Covent-garden Theatre.

CANNABIC.—BY M. ALBANO.

CANNABIC.—BY M. ALBANO.



STOVE.—BY MESSRS. CARR AND ROBERTSON, SHEFFIELD.

GOTHIC CLOCK.—BY TAHAN, PARIS.

STOVE. BY ROBERTSON, CARR, AND CO.

This is a very handsome stove—simple, but effective in style, and of admirable workmanship, by Robertson, Carr, and Co., of Sheffield. The upper part is of cast iron, the grate of polished iron or steel.

GOTHIC CLOCK. BY TAHAN.

M. Tahan exhibits a clock, inclosed in a small Gothic turret, in carved ash, which is very creditable as to workmanship, and will be appropriate for fixing in any part of an old-fashioned house.

HALL STOVE. BY JEAKES.

This production, placed in the centre of the east side of the Nave, is a pendant to one which has already appeared in these pages. The pair are among the best specimens of our inventions for creating artificial heat, as far as regards external appearance; and, without doubt, the glitter and cheerful appearance of this example will be preferred by many to the more laboured work in bronze of its companion. Each, however, must stand upon its own merits; and for the above-mentioned qualities this subject is inferior to none.

ARTIFICIAL STONE.—BY RANSOM AND PARSONS

HALL STOVE.—BY JEAKES, GREAT RUSSELL-STREET.

ARTIFICIAL STONE. BY RANSOM AND PARSONS.

The artificial stone and marble produced by Ransom and Parsons, of Ipswich, exhibit all the essential qualities of hardness, colour, and surface. The various objects which we have engraved show the applicability of these materials to all descriptions of building and decorative purposes.

FIREPLACE AND VASE. BY THE LADYSHORE TERRA COTTA COMPANY.

The Elizabethan fireplace and the vase which we engrave are very creditable specimens of the taste and finish displayed in the works of the Ladyshore Terra Cotta Company.

FIRE-PLACE AND VASE.—BY THE LADYSHORE TERRA COTTA COMPANY.

CAPRICES OF INVENTION.

INDUSTRY is one thing, and caprice is another, and a very different thing. In like manner, we may say that ingenuity is one thing, and whimsicality another; persevering good-sense one thing, and persevering folly a very different thing: so of workmanship and the production of a useful article, when compared with a prolonged waste of human labour in concocting and finishing a trifle, a toy, or an absurdity. These things all involve a different species of effort and result, and call for a very different sort of estimate.

Amidst the innumerable examples of well-applied labour in the Great Exhibition, so many of which we have already chronicled, and so many more of which yet remain which merit notice, and shall obtain it as far as our space will permit, it must, nevertheless, be confessed that there are also a considerable number, amounting, indeed, to a motley variety of articles, in the construction of which we are bound to say we consider that much thought, and yet more labour, have been grievously misapplied.

Foremost amongst these we must place Count Dunin's "Man of Steel." This is a piece of mechanism, in the figure of a man, which is constructed of seven thousand pieces of steel. Most of them appear to be either springs or slides, and they are so put together and arranged as to be capable of a graduated movement, by means of which the proportions of the whole figure may be expanded from the standard size of the Apollo Belvidere to those of a Goliah. From these colossal proportions it may again be contracted at pleasure to any size between this and its original standard, as now displayed. The only utility we have ever heard suggested as derivable from this elaborate piece of mechanism, is its applicability to the various measurements of army clothiers or tailors, as it would serve for the figures of men of various sizes. We do not know whether this is the purpose assigned to it by the inventor, as it seems a very absurd one, the same result being far more easily attainable by the incomparably more simple means of half a dozen dummies, or wooden lay-figures.

Dr. Gray, of Perth, has invented a medical walking-staff, containing instruments, medicines, and other professional articles. Would not a small tin case, or a sandwich-box, have answered the same purpose far better, and far more conveniently, as it might be put into the pocket, where the "medicines," not being half so much "shaken" as in the walking-staff, would have less chance of fermentation or other injury.

Mr. W. Chamberlain jun., of St. Leonards, has invented "a machine to record votes." Surely, this might have been accomplished equally well by a more simple and well-known process, which has generally been proved to answer all purposes in this case, viz. by a pen and ink—or, if secrecy were required, by a ballot-box.

An "artificial silver nose" has been invented by Mr. Whitehouse. We will not pronounce rashly upon this; but it strikes us, that, as all artificial noses, both in shape, size, and the amount of nose required, will depend upon the amount wanting by an individual, and the size and shape, in fact, suited to his particular case, the material also of which the nose was manufactured would very often have to be regulated by the special circumstances.

Art-manufactures in *mutton fat* are certainly a novelty, and Mr. W. E. Hall, of Bideford, exhibits a "a socle, or kind of vase," made of a mixture of mutton fat and lard. We should fear that in a hot summer, or in a cold winter when a good fire is needed in the room, these articles would be extremely liable to a change of form not at all contemplated by the inventor; nay, there might be occasions on which they "ran away" altogether.

Mr. M'Clintock, of York, exhibits a chain in regular links, the whole of which, we are informed, has been cut out of a solid block of wood: to what purpose, except to the unnecessary length of time such a performance must occupy, we are totally at a loss to conceive. Mr. M'Clintock has, however, been surpassed by a lieutenant of the navy, whose name has escaped us, and which we do not know where to look for in the Catalogue, who has achieved the same result from a block of wood with the help of no other tool than a penknife. Will anybody endeavour to surpass them both, we wonder, by doing the same thing with a pin?

We do not very well know what to say about the "ostracide," the instrument with a grand name for opening oysters, and bearing a close resemblance to a pair of sugar-nippers. It may be useful, or it may cut the oysters into rags in the operation; we hope not; but Messrs. Brown, of Newcastle, will excuse us if we hint, that, to avoid this, it may be necessary to practise opening oysters with the ostracide almost as much as with the old-fashioned oyster-knife.

"The semibreve guitar" of Mr. Dobrowsky was a good thought enough for a new name, and for a fresh attempt to prolong the sound of the notes of the guitar; but, if the inventor would have us understand by the term "semibreve" that his instrument will sustain a note in any such duration, we must plead absolute scepticism to the possibility of any instrument of this kind being made to accomplish such a result.

The enharmonic guitar, manufactured by Panormo, of High-street, Bloomsbury, claims for its original inventor and designer no less a personage than the ingenious Colonel Perronet Thompson, M.P., who some years ago invented a new kind of organ. Of the enharmonic guitar now exhibited, it is announced that it is "capable of being arranged in the perfect ratios for upwards of twenty keys." We do not doubt this: we accept it at once, not only from what we know of the scientific capabilities of a guitar, but of the great scientific attainments of Colonel Thompson: but after his enharmonic guitar has been "arranged" for any of these keys, what will be the effect of "playing" in them, amidst all this mechanical interference with the finger-board? So much for the impediments to execution, to say nothing of tone. We must say, in justice to Mr. Panormo, the manufacturer, that, being convinced his own simple guitars on the Spanish model have more tone in them than any other guitars, we regret he should have employed so much labour in the construction of this very ingenious, learned, and impracticable invention.

Mr. Jones, of Lombard-street, exhibits "a silent alarum bedstead, to *turn* any one *out of bed* at a given hour" This is certainly one of the most amusing inventions we ever heard of. It assumes a degree of density in the sleeper which no alarum can affect, or else a singular amount of luxurious weakness of purpose. The bed, therefore, acts the part of Resolution for the sleeper; and having been "set" over night for a given hour in the morning, the said incorrigible sleeper finds the bed revolve so as to tilt him out; and a bath being placed by the bed-side, he may at once be relieved of all need for summoning a resolution either to get up or to take a plunge.

Let us look at a bed of a very different kind—one that, so far from making the least pretence to any special utility, presents the most abundant illustrations of how many useless and extraneous adornments can be heaped upon a simple domestic article, till it becomes a wonder for its perversity. We refer to the grand bedstead in the Austrian department of the Great Exposition. The enormity of its bed-posts, and there seem to be at least a dozen of them rising in spires of various heights, with the high relief of the carving, and the massive magnificence of the whole design, and the finish of the carving in all its parts, gives this "bed," if we must call it by such a name, far more the appearance of a great model of a Gothic cathedral.

There is a Chinese bed, which, in its way, competes with the Austrian. It is much smaller, but ornamented with all sorts of curious and elaborate cabinet-work, the greater part of which consists of inlaid mother-of-pearl.

Of a similar class to the above, in egregious ornament, we must rank the most splendid of the Oriental saddles, several of which are so thickly embroided, as to present a positive bas-relief of a very rough kind. It would almost need a suit of armour, or at least a wonderfully thick leather lining to the seat of the unmentionables, to enable a horseman to ride with such a saddle for an hour without being horridly chafed, if not flayed, by the amount of friction.

The Chinese have long been famous for their caprices of invention, and whimsicalities of workmanship, over each article of which the greater portion of the lives of several artisans appear to have been expended. We find exhibited here some of their celebrated ivory balls, richly carved outside, and containing another, a size less, inside, richly carved also, with open-work, to show you, that there are balls within balls to the extent of twenty or more, each cut clear of the rest, and carved, and capable of being turned round—the whole of these being produced by means of a variety of curious tools and instruments, out of the first solid ball. This, they assert, nobody else can do; and it may be true, for the Chinese are capable of wasting any amount of time upon any triviality. It has sometimes occurred to us, that they may have discovered a certain ivory cement so strong as to be carved upon, and so exactly of the colour and character of ivory as not to be distinguishable; and if so these balls, instead of being all carved and hollowed from the solid round, may each have been cut in two, which would render the entire process easy in comparison, or at any rate would rob it, unfortunately, of the greater part of its difficulty. But this is only a speculation; we admit that we have never been able to detect the sign of a joint, and we never heard of one of their balls coming in two pieces, or even showing an artificial crack. But the Chinese are not the only people who have a love for difficulties, for the sake of the unnecessary labour and time they involve, which gives the article so much additional value in their eyes. If Quang Sing, of Canton, carves and engraves upon peach-stones, and makes baskets and boxes with the stones of apricots and nectarines, Mr. Jacob, of Coventry-street, displays egg-shells with carvings and engravings upon them, and "views inside." If Shee-king, of Macao, delights in wasting his own life, and the lives of others whom he employs, in carving a nest of ivory balls out of one solid ball, instead of obtaining a similar result (if the world *must* have these toys) by the regular tools and simple means of ivory workmanship, we find several of our own countrymen equally assiduous in substituting a common penknife in order to perform operations which proper tools would effect far more easily in a tenth, perhaps a hundredth part of the time. There seems, in fact, a sort of mania for this penknife-work. Mr. Aston, of Chelsea, executes a model of St. James's Church South, in cardboard, with a penknife; Mr. Scollick, of Birmingham, exhibits a model of St. Paul's Cathedral; and Mr. Dickenson, of Waterloo-place, a model of York Minster, each in cardboard, and each employing no better instrument than a penknife. M. Schnitzer, of Jerusalem, exhibits two vases carved out of a species of sandstone found in Jerusalem, with a penknife, which the proprietor, Sir Moses Montefiore, takes care to inform the world was "an ordinary penknife."

In the windows of most of the great cutlers of London may be seen knives with an extraordinary number of blades; and on the ground-floor of the Grand Exposition is exhibited a large glass case, as big as a handsome summer-house, full of all sorts of fine cutlery and other workmanship in steel, the most prominent features of which are several of these preposterous knives. Some seem to have 50 blades, of all sorts of shapes and sizes, others 150 blades, and one or two of them, we feel assured, cannot display less than 400 or 500 blades. To accomplish this capricious feat, the inventors are always obliged to have recourse to a strangely thick handle, of an utterly impracticable kind as to all handling: and in the glass case now before us will be found, one in the shape of a cross, thus combining four handles, each one crowded with blades; another has the handle in the shape of a star or double cross, thus combining six handles, each one bristling with blades, and arranged at the end of each handle in the form of a fan of bright penknives and blades of instruments. But all these are surpassed in capricious ingenuity by a "knife," the handle of which, if we must call it so, is a combination of three handles, each in form of a cross, the largest being in the middle. The three crosses are combined by an upright shaft, and each of the three comprises four handles. Thus, we have twelve handles in one, and from each of the twelve there sticks out a shining fan-work of blades and steel instruments, of all conceivable shapes, and all real or imaginary offices, not one of which could be put into operation amidst such a crowd. It is one of the most wonderfully useless things we ever saw. As to the number of blades and tools, they defy calculation. In the same case may be seen miniature knives, which are actually of the same kind, and present numerous blades from a handle of an inch and a half in length. There are also miniature knives and scissors of an inch long, of half an inch long, and of a quarter of an inch long; and, by way of completing the wonder, there are twelve pairs of miniature scissors, placed in little brass scales, which show that the whole twelve only weigh half a grain. They require a microscope to be seen properly, when it becomes manifest that they are perfectly formed scissors. We suppose Messrs. Rodgers would say, in explanation of all this fancy-work, that the use of it was to show the world what Sheffield could do, not only in work, but in play.

An American inventor exhibits a combination of the pianoforte and violin, with which he assumes that pieces can be played with the effect of those two instruments in concert. Something like this, no doubt, may be accomplished by giving an attachment to the piano, which shall produce a resemblance to the sound of a violin; but in the present instance the inventor has literally attached a violin, played upon by four bows, which are put in motion by a separate set of keys on a small upper finger-board, which cause the bows to "saw" (as we may truly say) upwards and downwards, with an effect which we frankly confess to be indescribable. You can see the whole operation; and a more ludicrous thing both to see and hear, it has seldom been our lot to experience.

An inventor exhibits a model of a carriage which supplies its own railway, laying it down as it advances, and taking it up after the wheels have passed over. This is extremely ingenious; but, unfortunately, it *supposes* the existence of a level line for the operation, so that its utility becomes rather questionable.

A drinking-glass is exhibited, with a partition for soda and acid, to be mixed separately, the junction of the two streams effecting combustion only at the moment of entering the mouth. Few people could "stand this" we should think.

The model of a ship is made with bottle-corks, and rigged in the same fashion. The object of this we cannot fathom.

Mr. Cossens, of Holborn, exhibits a model made in elder pith; and Mr. Clifford, of Exeter, displays models made "of the pith of the common green rush," which he carefully informs us is such as is "used in making rushlights."

In one of Hogarth's prints there is a capital satire upon the expenditure of extraordinary means to produce a simple result. You see a pile of complicated machinery, which indicates that an operation requiring great power is about to be displayed. The skill of the artist in the design and in the arrangement of light and shade causes the eye to travel about and examine the various parts of the machinery in order to ascertain the work it is about to perform, when finally you discover at the bottom of the great machine an ordinary wine-bottle, the neck of which is corked, and the whole of this machinery is evidently employed in "drawing the cork." Of a similar kind of elaboration in order to effect a very simple object, we fear we must class some of the new inventions in horns and flutes, to the former of which many complicated crooks and curves, and to the latter many scarcely practicable keys have been added, merely to enable the instrument to produce a certain note which might be omitted with no great loss, or produced by other means. Nothing injures tonemore than a superabundance of mechanism. Vivier always plays on the old French horn, without any of the present complicated improvements, and Nicholson used to play on a flute much simpler than many now exhibited, and we have never heard any performer who gave so much tone to the instrument.

In like manner, we find an exhibitor who displays a model cottage composed of 2000 pieces of willow wood (these also are all carved with a penknife); and there is a table to be seen which is composed of 2,000,000 of separate morsels, all inlaid in mosaic-work. The practical philosophers and economists of modern times complain of the great waste of human labour in the construction of the Pyramids of Egypt—let them go and look at this table.

Now, we are well aware that a thousand reasons may occur to the minds of the inventors of these curiosities, whereby they may persuade themselves that what we have called "caprices" are so many instances of genius; and a thousand letters might be written to us with a view to set us right in this particular. But this would be merely adding to the waste of time. It is not a question of argument, but of fact. There are the articles now to be seen in the Great Exposition; and those who are interested in the point can go and inspect them, and then ask themselves, "Are they useful?" We acknowledge their cleverness—in some cases, their extreme ingenuity; but there we stop.

CLOCK. BY SUSSE FRERES.

CLOCK. BY SUSSE FRERES.

This time-piece, intended for a chimney-piece, is in bronze. Above is a figure of Sappho; and on either side of the face are bas-reliefs of Venus and Diana. It is nicely executed, and, altogether, an elegant drawingroom ornament.

MR. CATLIN'S INDIAN FAMILY AND ITS MANUFACTURES.
A MUSEUM OF MAN IN THE EXHIBITION.

SINCE our first notice of the Aboriginal productions in the Exhibition, Mr. Catlin has brought the articles here mentioned out of his famous Indian collection; and unquestionably these almost solitary specimens of Indian industry make us largely Mr. Catlin's debtors. Their completeness so amply compensates their paucity, that he may be fairly said to have obliterated the neglect of others, in not eagerly seizing this happy occasion to display Aboriginal merit. The truthfulness of expression in the quiet features and attitudes of these two Indians proves how well Mr. Catlin has studied a race which may make his countrymen great in sculpture by its abounding in "*models only equalled in Greece;*"* and his judicious observation of this fact is gloriously supported by the contribution of Hiram Powers to the Exhibition.

These few signs of the occupations, the tastes, and the affections of the denizens of America will not be among the least suggestive of the cheering subjects in this great assemblage of man's works. The well known enterprise and ability of Mr. Catlin need no new encomium; but the one little group he now presents to us is far too remarkable in itself, and in its bearing on the fate of 20,000,000 of our coloured fellow-creatures in North and South America, to be simply enumerated among the things exhibited.

Here is *the stoic of the woods*, calmly witnessing the marvels of many lands, in some of which he has himself been an object of wonder. He is the type of the warriors, who, with a handful of brave men, have for three centuries made head against the enormous odds of European discipline and power; and who, in these latter times, have not in vain stood up against millions of unscrupulous, but miscalculating invaders. Nobly indeed stands he here in the breach, to tell the civilized world that the alleged *necessity* of ruin to any branch of the human race is not only an unholy paradox, but the allegation betrays the grossest contempt of facts and a glaring ignorance of history. He does better in simply appealing to the tenderest affections of the heart, by asking sympathy for his people in the person of his child. He also enlists our reason in favour of his race, by pointing at the Indian mother's ingenious and laborious handiwork which mantles the girl.

Who can reflect on the story told by this group without a pang, at the cruel impolicy of leaving such germs of civilization unprotected and undeveloped?

We are unable to destroy the *brown* man every where, willing as we are to do it; and after all the horrors perpetrated wherever white men have gone, that brown man is more erect before us than ever.

Mr. Catlin's chief here tells us *how* we may mend the melancholy past in this matter. We must treat the less civilized races as we would ourselves be treated, and bring them within our kindest community of social sympathies. So much is taught in the portraiture of the Indian's *child*.

Furthermore, the curious and useful clothing of them both; their gay ornaments, and rude historical symbols, shew how steadily, and pleasantly, and reflectingly, too, the Indian's leisure can be employed.

Dress of the Chief:—Deer-skins, with beautifully tinted porcupine-quills, and scalp locks. The head-dress is constructed of war-eagle quills, and ermine, surmounted with buffalo horns, cut thin and polished in the way usual with the Jews. The necklace is made of the grissly bear's claws; a lance in his hand, and a quiver and bow are slung at his back. His tobacco-pouch, of otter's skin, hangs across his arm. His mocassins are of deer-skin. *Dress of the girl*:—Dressed skins of the mountain sheep, which are softer than deer-skins. Mocassins, or beaded boots. Wampum or necklace and ear-rings of the bivalve fresh-water shells, and necklace of elks' teeth, which are rare.

Of the numerous articles on the person of the Chief and his daughter, it will suffice to select one for special notice.

This is the woollen robe of white, yellow, and black colours, on the girl's shoulders. It is manufactured by several women, of the wool of the wild sheep of the Rocky Mountains, a thousand miles beyond the limits of civilisation. The work is many months in completing; and justly is the challenge offered here, as Mr. Catlin himself is known to have often made it elsewhere, to discover the secrets of this curious work, or for the looms of England to copy this truly splendid fabric. Its dyes, its texture, and its symbolic figures, are all studies. For strength and for warmth, it is perfect; whence its teaching and origin, are great mysteries—whether connected with the labours of the sisters of fate of classic antiquity, or with those of the weird sisters of the north, are points alike obscure. The identity of this Western industry with that of the East will not fail to strike every observer; and it is earnestly to be hoped, that may of the hundreds of thousands who will here meet this Indian family, will feel how urgent is the call on us to lessen the evils of their condition.

These valuable products of native American ingenuity, unaided by the resources of capital, or by the advantage of subdivided labour and machinery, give the red Indians a title to our consideration. Such things go far to prove a community of industrial talents, and fully justify the resolution passed at the Peace Congress the other day, at the suggestion of M. Girardin, of Paris, that the aggressions of *strong* nations upon *weak* aboriginal tribes ought to be abhorred.

Upon what principle can we refuse the protection of the law of nations to men whose capabilities are thus demonstrated to be equal to our own, and whose hearts are proved, by all we know of them, to be like ours. It is this equality of treatment by *law* that must now be established on the firmest bases. If we would but respect in their case the rights of man, of which in our own we rigorously enough exact the observance, less would be heard of sanguinary conflicts between barbarians and civilized men, which are the great disgrace of our time.

These Indians and their works suggest a powerful motive for making the Exhibition *permanent*. Groups of such figures of all nations, correct in costume and features, would have peculiar attractions. The wax-work in Westminster Abbey and Madame Tussaud's gallery are the amusement of children compared

* Catlin's Indian Letters, (4th ed., 1844,) Vol. I., p. 16.

with what might be assembled here. Mr. Catlin's collection should be bought for the Crystal Palace; and thus, with many others of a like character, be saved from dispersal. Thus would be realised the idea of a Museum of Man, so brilliantly exemplified in Captain Shippard's large historical map, for the purpose of popularising the lessons of humanity to our fellow-men in every clime. Lectures on the whole subject, especially on an improved international code, should be read in these ethnographical galleries, to all the schools in turn, as well as to the public at large. History and descriptions of manners might thus be brought to bear particularly upon questions of policy; and what began in amusement, will end with instruction.

The American merchant Mr. Dunn's Chinese collection was an admirable example of what can be accomplished in this way. In such a museum there should, of course, be combined foreign occupations with national portraits, and foreign productions with the native mode of raising them.

Here would be found a frequent attendance of the Indians from America, the native African, the Hindoo, visitors among us; and a school of modern languages might with care be formed in a winter garden of perpetual spring. Mr. Paxton has not yet directed sufficient attention to this element of high utility in his famous design.

LETTERS FROM LONDON

ON

THE GREAT EXHIBITION AND OTHER MATTERS.

BY PELEG E. WHEELER,

WITH AN INTRODUCTION BY BAYLE BERNARD.

(*Continued from page* 136.)

LETTER VII.—TO DR. HIRAM TUCKER, MOUNT CLEAR VISION, PENOBSCOT.

THE EXHIBITION—ITS RELATIONS—FIRST IMPRESSIONS AND GREAT CONTRASTS—SAXON AND CELTIC—FREE AND FETTERED RACES—SPECIAL FEATURES AND DISTINCTIONS—CHINESE, INDIAN, RUSSIAN, GERMAN, ENGLISH, AND AMERICAN—CONCLUSION.

RESPECTED DR. TUCKER,

WHAT's a man to do when he ought to talk and can't—when he's so full he can say nothing—when he's so wise it makes him stoopid—when he's got a lump of gold in pocket, and not a cent by way of currency? If you choke a stream in that way, of course it overflows; and if you stuff a skin, you bust it: but it aint so with the brain; its door seems to open innerds, and the more it's packed the more it seems to jam the latter fast. I vow if 'taint my own case—if I aint in a most uncommon fix, Doctor; if I aint as bad off as a fox with a spring trap in his gizzard. You know what was my business here, to see the Exhibition; that was my chief eend. Whatever I saw besides, the old country and the folks in it, and the grand old mammoth capital, my real and special purpose, not only from our townsfolk, but all the intellect and enterprise, I may say, of our State, was to give a full and true account of the world's wonder in the Park—a clear plan of the Building, and a list of its contents, that should sarve as a public dokyment for libraries and archives; the substance, size, and vally of every article exhibited, with names of owners and of purchasers up to my latest writing. And how have I proceeded? Why, I accordingly took a lodging as near to the Warehouse as I could; and here for a hull month have I been going to it daily, for nine hours at a spell, winding my way about it with my eyes upon the stretch, jist as prying as a weasel and as supple as a snake; taking every section on't, long and cross and sideways, middle path and side ones, courts, and tents, and galleries; pulling round by this post and mooring by that counter, climbing up one staircase, and diving down another, 'till I vow if I believe it's got an implement or fabric I aint squinted at or handled, or a foot in its twenty acres but mine's been over twenty times. And what on airth's the upshot? Why, as I tell you, Doctor, nothing! I'm so knowing I can't speak. I've swallow'd such a lot that I aint able to digest it. I've got what you call a surfit; feel as if my brains were busting, and the only way to save 'em is to hoop my skull with iron.

So you see the fix I'm in, Doctor, and what a blistering I'm gitting; when letters are coming daily, wondering what the snake's the matter; why in the plague's name don't I write—I've seed the show by this time, and why don't I describe it—jist the Building and contents on it, or the contents alone—that's all. You remember Asa Whipple, when he'd a mind to stand for President, and the Deacon said he had only to make the Union think as he did. "Yes," said he "that's all," and I rather think I'm like him—all I've got to do is to make our people think as I do—look and feel with my five senses—that's all—quite a trifle. Why, good nation! Doctor, if I was stump'd in describing London, and for no reason but its bigness, because, as I said, it's a Congress capital—a hundred glued together, what the dogs am I to do now, when this show is jist like notl ing that was ever seed or heerd on since the airth began to spin—when it's as new as a fresh comet, and about as easy to make out; when it's as strange as a law of matter that's got to show us its results? Size aint the greatest wonder, except it's to a savage. Multitood's as wonderful, and so agin's variety. There's no mountain that can puzzle you like the million plants it nourishes, and there's no human work whatever that can paint the look of this: you know there's no knowing anything unless you've a scale to try it by; and so, s'posing I was possess'd of a thousand lawyer power of talk, and could make a team of the strongest epithets to drag the idea before you, I want to know where'd be the vally if you'd no standard in mind to try it by and make sure it was a fact? 'twouldn't 'vantage you a cent, and I should only waste the paper, and you an uncommon sight of patience. Still there's a track through every wood, Doctor; and granting I can't say everything, is that a reason altogether that I shouldn't speak at all? Granting there's no doing justice either to the Building or the things in it—its million looks of beauty and skillfulness and use, aint it possible to give a notion of its general effect, and by means of its special features, and its broad and grand distinctions, to hand you in material with which to build the place yourself; I supplying walls and basement, and you, with your own fancy, putting in the lath and plaster? I guess that's our only plan, Doctor. 'Taint the only case you've heerd on, where we can't do all we wish, nor that we've found out that our dooty is to do the best we can.

Well, then, Doctor, the first thing I've got to say is, that this great show of the Park has got two kinds of relation—first, to its own time, and next to its contributors; and, to begin, I want to ask what's the natur of its own time—aint it that of progress? Has there ever been an age when the great interests of our speshy went ahead as they do now—when knowledge was so diffused, or so applied to useful purposes, when the stream was so swift and deep, or put so many wheels in motion? But that aint all my question: what began the current? 'twarnt spontaneous like combustion; it must have had a source, and what was that? Why, our own great revolution. Yes, Doctor, that's the fact; however, it may be larf'd at, it aint to be upset. The independence of Ameriky was the first move in that of man's. Jist note the steps that foller'd it, and see if they aint as reglar as rounds upon a ladder, or sheep marks up a hill. Take the first—the stir in France. Didn't that come out of curn? If want and tyranny laid the fire, didn't our cinders kindle it? Didn't a whole raft of her young patriots come and serve their time with us, before they went home with Larffyette, and set up for themselves? And after her great flame had travell'd over Europe, shrivelling up old feudalism and other weeds of that sort, didn't it flare across to England, and send into it a heat which burst out at last in reforms and abolitions? first of the white slaves in the country, and then the blacks abrond; and side by side, or following it, warn't there that grand current of discoveries which aint half completed yet, and which has made the time we live in an age of revolution? Take gas as a beginning; gas which push'd aside lamp oil, that type of old worldnotions, that had neither strength nor steadiness, but was altogether dim and gloomy. Then steamboats, grander still, to put an end to sailing—another old world notion that made us slaves to wind and tide, when here came in a principle that raised the slaves to masters. Warn't that a revolution? Then steamers upon land, when the rail displaced the waggin, and the "iron horse" was found to have the best idee of going; and then, to cap 'em all, the telegraph; when roads were made of wires, and thoughts were sent a travelling a little quicker than their skulls? I want to know whether each on 'em warn't a first-rate revolution, and whether all on 'em warn't owing to the one that we invented?

Well, Doctor, it being the fact that ourn's the age of progress, what's the fact of this Exhibition? why, that it's the age's grandest evidence and most triumphant symbol; the noblest emblem of the triumph of the peace and industrial principle over the aggressive and destructive; the surest hope that human good is made to conquer human evils, and proof that peaceful intercourse begets the knowledge that extends it. This is its first relation, Doctor—its connexion with its age; but it's got another—to its contributors, and what's that? why, simply this, that it's suthing more than a proof of progress, it's also the best measure on it. If it's a table on which the world has recorded its advancement, isn't it clear, also, that it's a scale to ascertain each part of it—a gauge of every nation's movement, from the foremost to the last—whilst it also serves to show both what marks and what connects them? Thus, if England and Ameriky contribute use and substance—France and Italy, fine arts—and the East, luxury and splendour—aint it clear, that, whilst you see the rank of each in cultivation, you see also what they want to make their own possession perfect. To know our wants, is our best knowledge, since it is that that stirs up our energy; and this is the Exhibition's vally, if we choose to understand it; to prove by direct comparison what each people stand in need of, and so urge 'em to take something in exchange for what they give. Don't you see, then, at a wink, its great beauty and distinction, that it seems to combine within itself the scheme of a complete industrial system, only the elements, at present, scattered over a hundred courts and counters?

And now, what was my first impression when I entered the Peace Palace? I've already spoke about its substance, its shell of glass and iron, and said I held it to be typical, denoting the strength and clearness that our speshy stand in need of; and I spoke also of its form as carrying out this notion, being low, and firm, and practical, taking a good hold of the airth; but there was another fact that struck me to be as pleasing as the rest, and, you'll see, jist as appropriate, and that is, its direction. It lies from east to west, Doctor, which, as you know is the path of progress—the direction it has taken from its rising in Chaldea to its meridian in England, from the plains of Shinaar, all the way to the praries of Winconsin. Westward it has moved allers, and westward 'twill continue until it has gone clean round the globe, and reached its point of starting—'till it has spread its light and liberty through the last abode of savageness. So you see this Mr. Paxton has got some clever notions, and here was the ground of one, as good almost as that of the show itself. But now comes the hitch, Doctor; how do you think it has been carried out? As the Building contains products from all quarters of the globe, they aint, of course, upon a level—some are forrerd, some are backard. Here's Toonis, Turkey, and Chiny, making and using at this moment all the implements and fabricks that were in wear among the Patriarchs. When you look at their contributions, you see sand, and smell hot air. There's a desert right afore you, and lazy camels lounging over it, jist as the whole world used to lounge when time was of no vally; and here's England and Ameriky, with their steam and rail and telegraph, showing what the world requires in the ery we've got up to. Now, you see that these five countries form the two eends of our history—the old world and the new—man as he was in infancy, four thousand years ago, and as w see him now in manhood, in the times and lands we live in. Now don't it stand to reason that these countries should have been ranged in the order of their progress; that the pathway of the Building, lying as it does from east to west, should have been made to represent the actual path of history, by clapping Ashy in the east of it, and Ameriky in the west, and Europe in the centre? Wouldn't this have made the Building a grand diagram of history—a model of the world's progress—when its pathway down the centre would have shown Time's westward track, and the nations on each side of it the stages of its movement? Warnt that a truth worth teaching? They talk of the Show's vally as a means of edication—say that's another good on it, and one of its great objects; and, accordingly, all the schools have pour'd into it like mill-streams, and professors by the coach-load have jump'd upon its counters to lectur to their pupils; and if this notion had been effected, jist see the world of knowledge their young skulls might have been pack'd with; they'd have larnt history with a look—taken in the pith of libraries by one movement of the head—seen the two ends of our history opposed to one another, and the steps that mind has took to reach its present statter: wouldn't that be edication, and something worthy of our age? Not crawling along to knowledge by the old school rate of going, but flying by the system that teaches things instead of signs, and offers the mind the kernel, whilst it throws away the husk. And what do you think's the fact, Doctor?—I know you won't believe it—why I vow if these Commissioners aint the biggest fools in Europe; if they arn't gone and turned the Building into one long stoopid blunder—made it a jumble jist as bad as if the different countries had all been shook together by an airthquake or a whirlwind. They've actually clapp'd Ameriky at the east end of the pathway, England at the west, and Ashey and Afriky right smack into the centre. What do you think of that, now? aint that a view of history?—ain't that a proof of fitness to assist in edication? Wouldn't you think such a set of fellows had been born down in a fen, and come to London in a flock, to represent their brethren?

But what were my next impressions? Now, if the great fact of this Show is its wonderful variety, rendering it altogether impossible I could give you a just account of it, you'll see that all that's feasible is my singling out such looks of it as show the big varieties, whilst I let alone the small ones. When we go into strange countries we see a dozen leading featurs—in its governments, its townships, and its general social system—which are all so many circles running one into another; and we take one of these, perhaps, as a sample of the lot, and that's the road that I go, jist to take up the varieties that show the Exhibition strongest, and finish off with speshal features in each country's contribution. Now, the first difference that struck me was in regard to human races—the opposite track that people take in enterprise and product; the Saxon race, on the one hand, going for use and gain and substance; and the Celtic, or the southern ones, for beauty, show, and splendour. The one working for the wants and solid interests of man, and t'other for his pleasures and his personal adornments. Now, whilst it is clear that both are needed to satisfy his natur', and develope industrial energy by labour and exchange, still we've heer'd the question ask'd—which of the two is superior, and likely in the eend to have the whip-hand of the world? Now, that's a point, I think, that the Exhibition settles, for it claps the fact before you; that, whilst the Celtic folks show nothing in the way of useful science, contribute not a mossel to the actual wants of man, the Saxons, on the other hand, not only furnish everything, but are able, if they've a mind to't, to do their neighbours' work as well. Side by side with their steam-engines, and solid furniture, and implements—they also show their marble statties, their silk, and lace, and gold-work, which is plain that time and practice will make as first-rate as their knives. They also can do the fine things as well as the good and strong ones; make a table for men to dine at, and put the carving round the legs. Now, I s'pose this gets the verdict. If society requires the union of the useful and the beautiful, and one race can do but one on 'em, and t'other can do both, I want to know if 'taint as plain as 'rithmetic can make it, the Saxons are the cleverest, and must one day hold the whip.

The next difference that struck me, Doctor, was the influence of climate—the great fact of the inequality of the four quarters of the globe. Whilst Afriky and Ashy seem to work but for themselves, contribute little man can use out of their own infarnal regions—whilst they've neither strength nor skill to compete with northern industry; Europe and Ameriky, it's plain, can work for the hull world, and send cotton to hot climates as well as furnitur to cold ones. Aint that an important fact, Doctor, as regards our race's destiny? Don't it point to the two fields of its ultimate exertions? Don't it shew that man's a plant, who, if form'd to take root anywhere, in moderate climats only can come to its perfection? Whilst a third difference agin, Doctor, was in respect to institooshun—was the difference of aspect between the free and fetter'd races; and here agin this Exhibition is a great book of instruction, every leaf of it having a lesson that may be pondered with advantage. Now, I needn't tell you, Doctor, my opinion upon slavery. If there's a man in the Union hates it, his name is Peleg Wheeler; if there's a man that thinks it not only a cuss and stain upon our country, but 'twill one day be its ruin, if 'taint pretty soon got rid of, it's him agin jist mentioned. But, at the same time, let's be just, Doctor: slavery aint confined to skin; there's plenty on it in Europe—millions there of white men, as much degraded as our blacks: so the clear course for a man is to hate it under all forms, and wherever he finds it lurking, in whatever skin or country. And arter its first offence, its great sin agin humanity, what is it we should hate it most for? Why, its obstacle to progress. When you make a man a slave, 'taint only he's no more a man, but he ceases to live for men—he lives only for his master; he's an animal that's only useful to the hand that holds the whip, and only lives for food and slumber; the world then loses all the good that would have come out of his freedom, that's been crushed in his mind and energy,—and here's a signal proof on it. What has the slave sent to the show? raw produce, nothing more, jist the product of hand labor. And who is it that's filled its space with all its brain-work, use, and beauty? who but the freeman, Doctor? the freeman, who works for all humanity?

And now, to finish off with jist a look all round the Warehouse, and a word on what I think the speshal feature of each sample; and s'pose we begin wi' Chiny, as that's the oldest country—Chiny, that has allers been first-rate for making puzzles, and that we have allers said, Doctor, was the biggest one itself. Now ain't the pictur in their teacups an image of the people? Three fellers on one leg going over a bamboo bridge, which is the very thing they were doing five thousand year ago, and there they're at it still, and harn't got over yet. Aint that the Chiny mind—a look of motion, but no progress? skill, and sense, and industry, all wasted upon trifles? Don't they still go on cutting twenty balls within one another? making lamps like scooped out pumpkins, and Chinymen to shake their heads, as if at their own inventions? Aint these curus critturs jist the big boys of the world? and aint that their sample's character, jist the big boys' contribution?

Next take Ashy gin'rally, Ingy, Turkey, Parshy; and what's the featur there? why, if you want it in plain words, Doctor, it's the wild beast contribution, it's nothing else from first to last but a piece of homage to destruction—a grand flaring glorification of selfishness and slaughter; not an article amongst it for the use or good of man, but all tributes to his vanity or engines for his death—pistols, swords, and daggers, all bright with gold and carving, or warriors' dresses, kiver'd with jewels, and flashing like the sun. A pretty sample, aint it, to send to a Peace Palace? unless it's by way of contrast to its furnitur' in general: jist as we see, on a doctor's shelves, poisons and antidotes together. Though there's one thing in the lot that I must say is satisfactory. Hanging up amongst it are skins of tigers and wild beasts—who, of course, must be considered the fighting man's grand ancestors—the models, for the most part, of all true martial heroes. So you see these skins were wanted as a piece of filial reverence, and sarve, as I consider, to stamp the whole collection.

We'll next move into Europe, and take its two big empires, Austria and Rooshy, and what do we see there? a mix'd look, not a doubt. Implements and fabrics, both for human good and injury—and skill, and taste, and energy employed in both directions, but the good in 'em the least part, and that not meant for many, but shown in things of luxury for the enjoyment of the few; and the cause on't is apparent. Here Europe herds her white slaves, men fettered to the soil, and bought, sold, and worn out with it, at their lord's and ruler's pleasure. This explains the curus mixtur' of these grand Imperial samples—the good was produced spontaneously, the bad to please their rulers; the man worked for his fellow-men, the bondsman for his master. 'Tis the white slaves' contribution; and moving westward to North Germany, to France, Switzerland, Belgium, there we see mind spreading like the light and heat of sunshine. We see the collections rising both in use and human feeling, growing good and beneficial, and at the same time universal, not for the sarvis of the few, but for the use of all humanity; till at last we come to England, the great head of Eastern progress, and behold in hers the great triumph of fraternal contributions!

Yes, Deacon, it's a fact, in the friendly fight of the Exhibition, England's won the day. In this race between all nations she has carried off the prize. Measured by the interests and demands of human welfare, her collection is the jam—the top notch of the whole, first in all departments of practical utility, and second only to the first in all the fields of taste and beauty.

And how about Ameriky? Well, it's no use to disguise it—the truth was known some months ago, so it's no pain to speak it now; the fact is, Doctor, we're a failure—an indisputable failure—and the shame is all the greater, because the fault is all our own. Everybody knows that we've a flood of first-rate notions in every field of science which we ha'n't been pleased to send, which, either through prejudice or meanness, we have been such fools as to keep at home. And what's the consequence? Why, of course, that we're vallied at our own estimate; and the poorest crittur of a European has felt justified in sneering at us. We've wilfully damaged our own character, and almost want a show of our own here to wipe off the disgrace. The only thing we have made a stand in is the article of sculptur. The only hook we hang by is Hiram Power's statty. That "Greek Girl," it's admitted, is the star of the Exhibition, notwithstanding there's a whole raft of marble gals beside her, every one of which deserves a pair of eyes to look at. That's all our consolation. If we show nothing in invention, we've done su'thing in imitation which whips Europe out of sight. In sculpture, if not the sciences, we've gone on ahead, full bile; but as for any novelty, tho' we're jist those 'twas expected from (and that makes my wrath the greater, seeing, as I do, the disappointment), why—eh—yes; hold on a bit; we *have* shown some invention—done su'thing that's quite original. What do you think, Doctor, of the art of *sculpturing in soap*? Aint that a new idea? and, what's more, illustrated in the immortal head of Washington—the face of our great deliverer actually sculptured out of shaving stuff; and his grand and manly mouth looking as if 'twas bursting into lather! Aint that a splendid notion. I guess that whips the world. And so, as my say is ended, I remain, dear Dr. Tucker,

Your faithful friend and servant,

PELEG E. WHEELER.

GREATOREX'S HOISTING MACHINE.

CLASS 5, NO. 415.

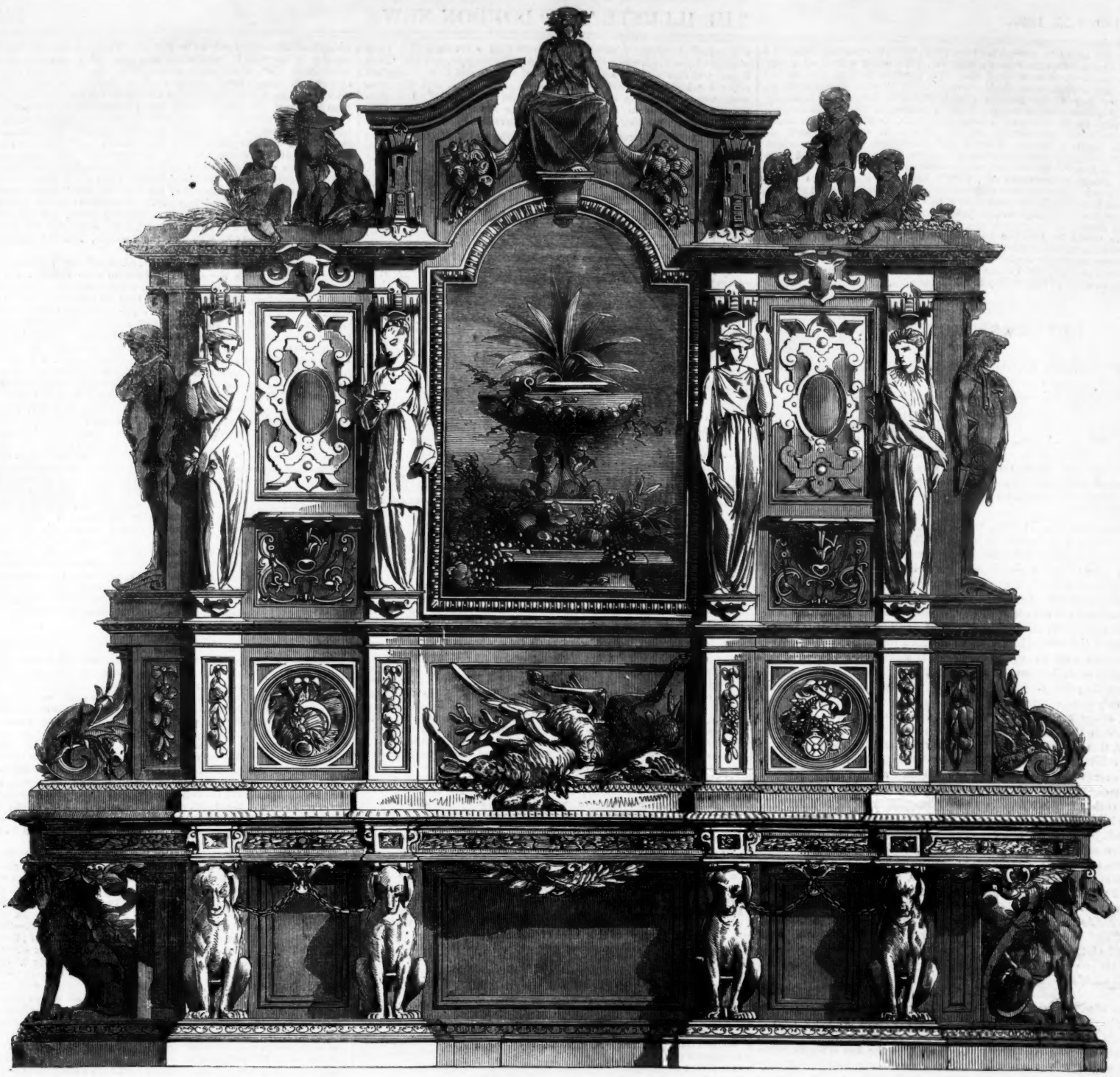
HOISTING machines, or "lifts," were originally invented to supersede the use of cranes, derricks, and teagles, especially for the interior of Manchester and other large warehouses and buildings, which, from time to time, have been much improved in many of their details; and which are now in very extensive use, not only for warehouses, but also for club-houses, hotels, and other large establishments. In London, the extensive warehouses of Messrs. Bradbury and Greatorex, and of Messrs. Morley, Baker, and Tucker respectively, are fitted up with such machines; as also the Reform, Conservative, Army and Navy, and other club-houses. In the latter case, however, the use of these contrivances is chiefly for elevating and lowering to the different floors, dinners, breakfasts, &c., so that hot closets are required to be appended to them. Not only was such a contrivance designed for the present Fishmongers' Hall, but also a "hot plate dining table."

The chief advantages of the lifts are economy of labour and space, together with the utmost convenience in raising or lowering goods to or from the different storeys of buildings, instead of carrying the same up and down stairs.

The principle, however, of the "lift" is of far more extensive application to public buildings for ascending rooms, especially in the case of lofty erections. The Colosseum may be mentioned as a building in which such apparatus was found to be most useful, as an ascent to the top by the ordinary stairs is very fatiguing. Lifting rooms were proposed for the stations of the intended City and West-End Railway, designed to be carried by a spacious tunnel under the New-road and City-road respectively.

The machine is supposed to be fixed in a section of a building of the warehouse class, and may be worked either by hand or steam power from any story. It contains several improvements on those ordinarily in use, as in the arrangement of the breaks, the motion for shifting the gear, &c., by which the machinery is simplified and its action rendered more certain.

The mode of applying the machine is as follows:—The floor of the ascending box is brought to the level of the floor of the warehouse, and secured by the break. The goods are placed on to the floor of the machine, the break released, and the endless rope on one side of the machine being pulled, causes the box to ascend or descend to the particular floor



SIDEBOARD.—BY FOURDINOIS.

as required, when the whole is instantly stopped by turning the break-handles, on the right-hand side of the apparatus. One such break-handle is applied for each story. There are both fast and slow motions, according to the nature of the loads required to be moved; and these are available on any floor, by simply turning to the right or left the handles under each of which is an index-plate, with the words "fast," "slow," or "out" (of gear), respectively marked thereon.

The model is constructed to one-eighth of the full size, and represents a machine capable of raising to a height of 50 feet about half a ton, by the labour of two men, in about two minutes. This is with a slow motion. It is perfectly manageable with half the weight by one man; an additional balance weight being provided in the centre, gives additional power, and can be applied at any moment. A break motion, a simple arrangement, is fixed inside the box to enable any person to descend without additional assistance from any other floor of the building, and to stop at any other floor to which he may desire to go.

SIDEBOARD. BY FOURDINOIS.

This, which is undoubtedly one of the best pieces of French furniture sent for our exhibition, deserves particular attention for the thought which has been bestowed upon its design; and which is more evident therein than in any other similar work of foreign taste.

The four figures, instead of being the usual repetition of the emblems of the quarters of the world, are representations of the dessert, wine, coffee, and tea: beyond this judicious choice of ornament, the spectator observes that the intention of each figure is so clearly and cleverly marked as to be unmistakeable; this is a virtue too often wanting in more ambitious works, to be passed over in silence. The figures on either side represent fishing and hunting; all are beautifully sculptured. The little figure at the top of the design is too small; and the petty conceit of coupling the dogs at the base, although a topic of admiration for young ladies and gentlemen, is too serious a breach of taste to be slighted: the deer resting on the banquette, or rather where the banquette should have been placed, is likewise a specimen of that false spirit of æsthetics, which supposes that because nature is beautiful in itself, literal imitations of nature are equally beautiful in all places. It will be noticed that the Engraving shows the picture which occupies the centre of the design as darker than the whole framework: this is the reverse of the fact, but its success shows what ought to have been the case.

It is to be regretted that anxiety for brilliancy of effect has caused the introduction of side brackets for lights between the figures; now the middle division is lighter than the lower and upper supports, and the top is heaviest of all.

FURNITURE.—BY WEBB, BOND-STREET.

FURNITURE. WEBB, BOND-STREET.

The table, exhibited with two chairs, claims to be Elizabethan, and of old workmanship, from its apparently free and careless handling; nevertheless, the carving of all the three articles is equally beautiful. The table is a very pretty, well-proportioned design, and is superior in every respect, but that of execution, to the chairs, which are left quite plain at the back, in the French fashion, and are too loaded with projecting ornaments to be used with comfort.

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